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REPORT OF WASTE SOURCE INVENTORY AND EVALUATION, DADE COUNTY, FLORIDA

TECHNICAL APPENDIX I. MAJOR MUNICIPAL WASTEWATER TREATMENT FACILITIES

ENVIRONMENTAL PROTECTION AGENCY

JUNE 1971

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Seventy-six wastewater treatment plants were surveyed between November 28, 1970 and February 2, 1971. Analyses were performed to determine treatment efficiency, adequacy of bacterial disinfection and effluent loading. Technical Appendices I and II are the engineering and laboratory evaluations of each plant. An industrial waste inventory located and identified the significant industrial waste sources.

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WASTE SOURCE INVENTORY
AND EVALUATION
DADE COUNTY, FLORIDA

TECHNICAL APPENDIX I
MAJOR MUNICIPAL WASTEWATER
TREATMENT FACILITIES

ENVIRONMENTAL PROTECTION AGENCY
SOUTHEAST REGION
SOUTHEAST WATER LABORATORY
TECHNICAL SERVICES PROGRAM
ATHENS, GEORGIA

JUNE 1971

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SPRINGFIELD, VA. 22161

REPORT OF
WASTE SOURCE INVENTORY
AND EVALUATION
DADE COUNTY, FLORIDA

Environmental Protection Agency
Southeast Region
Southeast Water Laboratory
Technical Programs
Athens, Georgia
June 1971

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INTRODUCTION

In July 1970, the Governor of Florida and the Florida Department of Air and Water Pollution Control requested assistance from the Environmental Protection Agency, Office of Water Quality (formerly Federal Water Quality Administration, USDI) in determining the water pollution abatement requirements for Dade County, Florida. A Federal-State Enforcement Conference held on October 20, 21 and 22, 1970, made the following recommendations:

1. Pollution of the navigable waters in and adjacent to Dade County, Florida, including the Atlantic Ocean, Biscayne Bay, and tributaries thereto, which endangers health and welfare of persons, is occurring and is subject to abatement under the Federal Water Pollution Control Act. This pollution is caused by discharges from numerous municipal, domestic, and industrial sources within Dade County.

2. Measures taken to abate this pollution have been inadequate.

3. The nature of delays being encountered in pollution abatement are: complexity of the problem; lack of effective planning; financing and enforcement of pollution control law; and lack of a commitment by the community to meet the pollution problem and abate it.

4. The Metropolitan Dade County Commission shall present a master plan for abatement of pollution from all sources in Dade County to the conferees, through the State of Florida, by November 1, 1971. This plan is to be in a form acceptable for certification under applicable State and Federal laws and regulations. The plan is to contain sufficient detail so that all significant sources are identified. The plan is to include a time schedule for construction with interim dates for arrangement of financing,

preparation of preliminary plans and specifications, preparation of final plans and specifications, award of contracts, and initiation and operation of remedial facilities.

5. The cessation of all waste discharges into the inland canal system of Dade County, Florida, shall be accomplished as rapidly as possible but not later than January 1, 1973.

6. A minimum of secondary treatment, providing at least 90 percent BOD removal and year-round chlorination of the effluent, shall be provided for all waste, as required by the State of Florida before discharge to the ocean, as rapidly as possible but not later than January 1, 1974.

7. All new construction shall be connected to adequate sewage collection and treatment systems. The conferees will meet not later than February 1, 1971, to consider the question of Dade County's building permit program with a view toward controlling additional pollution sources while the Dade County pollution abatement program is under design and construction. It is expected that the Dade County Metropolitan Commission will be prepared to present their action program to the conferees at that time which will satisfactorily meet this problem, including a program for the elimination of septic tanks in all urban areas of Dade County.

8. Additional waste discharges to Lower Biscayne Bay, including the Biscayne National Monument, and its tributaries shall be prohibited. This same prohibition shall apply to discharges to canals in Dade County which drain to the Everglades National Park. Removal of existing municipal and industrial waste discharges from these waters shall be accomplished as rapidly as possible but not later than January 1, 1974.

9. All wastes from vessels used as domiciles or business establishments shall be discharged to onshore facilities. The Corps of Engineers is requested to report to the conferees by February 1, 1971, on its program for removing abandoned hulks, debris, and other obstructions to navigation in the Miami River.

10. An inventory of all municipal and industrial waste sources within Dade County, Florida, shall be initiated immediately by the Federal Water Quality Administration in cooperation with the State of Florida and local officials, and a report shall be made to the conferees by April 1, 1971.

11. A technical committee comprised of the Federal Water Quality Administration, the State of Florida, and the Dade County Pollution Officer shall be established to develop, in cooperation with other Federal, State, and local agencies, a regional water quality management plan for the conservation and reuse of the waters of Dade County. This committee shall report to the conferees as to its progress and future plans by November 1, 1971.

Pursuant to Recommendation 10, an inventory and evaluation of municipal and industrial waste sources was conducted between November 28, 1970, and February 2, 1971. The present report together with Technical Appendicies are the result of that study.

A second session of the Federal-State Enforcement Conference held on February 18 and 19, 1971 made the following recommendations:

Recommendations 1, 2, 3, 5, 6, and 11 remain unchanged.

The recommendations which were modified are as follows:

4. The Metropolitan Dade County Commission's interim reports on the development of an updated master plan for Dade County to the Conferees

on February 18 and 19, 1971, indicate general progress. On April 13, 1971, the County Manager's Office will bring an interim progress report to the attention of the Conferees. A report on the upgrading and expansion of the Virginia Key Plant will also be furnished to the Conferees by April 13, 1971.

7. The Metropolitan Dade County Commission's response to Recommendation 7 concerning building and occupancy permit approval is vague and nonconclusive. To insure compliance with the recommendation, the Conferees require interim reports from the Dade County Pollution Control Officer. The first report is to be furnished by April 13, 1971, as to progress and problems in this vital area of concern and bi-monthly thereafter.

8. Additional waste discharges to Lower Biscayne Bay, including the Biscayne National Monument, and its tributaries shall be prohibited. This same prohibition shall apply to discharges to canals in Dade County which drain to the Everglades National Park. Removal of existing municipal and industrial waste discharges from these waters shall be accomplished as rapidly as possible but not later than January 1, 1974. The Conferees recognize technical problems associated with Recommendation 8. The City of Homestead should instruct its engineers to prepare feasibility studies on disposal of treated waste effluent to the subsurface through deep well injection. Other alternatives should also be considered with the Department of Air and Water Pollution Control.

The County in cooperation with the U. S. Geological Survey and the Environmental Protection Agency should actively monitor the General Waterworks deep well system at Snapper Creek Plant. The information obtained from the operation of this deep well injection system will be of fundamental guidance to the disposal of treated wastes in Dade County and should be made available to the Conferees on a bimonthly basis beginning April 13, 1971.

9. All wastes from vessels used as domiciles or business establishments shall be discharged to onshore facilities. However, the Conferees take cognizance of the regulations controlling such discharges which are currently being developed by EPA and will modify this provision accordingly when the regulations become effective. The Corps of Engineers is requested to report to the Conferees by April 13, 1971, on its program for continuing the removal of abandoned hulks, debris, and other obstructions to navigation in the Miami River.

10. Based on the inventory completed to date, the following wastewater treatment plants must be cited as being in violation of State and County standards:

Riverdale Estates
Andover Subdivision
Doral Country Club
Miami Lakes Utilities
Southern Estates Utilities
Leisure City Utilities
Peninsular Utilities
Carol City Utilities
Community Utilities
Atomic Sewerage
South Miami Heights
Little Abner's Trailer Park
Pan American Hospital

The Dade County Pollution Control Officer will report back to the Conferees on remedial action taken towards compliance with State and County standards by April 13, 1971. Additionally, the Water Quality Office will continue its inventory and analyses of municipal and industrial sources and will give a final report with recommendations to the Conferees on April 13, 1971.

Authority

Authority for this study is derived from Section 10 and Section 5 (b) of the Federal Water Pollution Control Act, as amended.

Acknowledgements

The active participation of Division of Field Investigations - Denver Center and Cincinnati Center; Southeast Regional Laboratory of the Florida Division of Air & Water Pollution Control; and Dade County Pollution Control is gratefully acknowledged. The Lower Florida Estuary Study Office, Ft. Lauderdale, Florida, was responsible for the project.

Explanatory Comments

The Goulds-Perrine wastewater treatment plant is under construction. It is a 2 MGD contact stabilization plant with pressure filters and phosphate removal, aerobic digester and sludge drying beds. Effluent will discharge into Black Creek.

Fair Havens, Virginia Gardens Apartments, Palmetto General Hospital, and Caravel West Apartments treatment plants began operation after the survey was completed. The treatment processes employed at these plants and other pertinent information are presented in Table 2, but inspection reports and chemical analysis could not be done.

Twelve treatment plants listed in the Supplement to Metropolitan Dade County 1961 Master Plan for Sanitary Sewage, January 15, 1971, are not included in this report for the following reason:

AeroJet General Corporation	Company closed.
Burdines, Hialeah	Waste to North Miami ocean outfall.
Coastal Towers	Waste to Miami Beach ocean outfall.

Eastern Shores	Waste to ocean outfall.
K-Mart, Hialeah	Waste to North Miami ocean outfall.
Kings Point Apartments	Waste to ocean outfall.
Lake Cecile, Hialeah	Waste to North Miami ocean outfall.
Palm Spring Shopping Center, Hialeah	Waste to North Miami ocean outfall.
Sheraton Beach Hotel	Waste to ocean outfall.
Interama	In planning stage.
Metro North Dade	In planning stage.

SUMMARY AND CONCLUSIONS

Seventy-six wastewater treatment plants were surveyed between November 28, 1970 and February 2, 1971. Analyses were performed to determine treatment efficiency, adequacy of bacterial disinfection and effluent loading. Technical Appendices I and II[1] are the engineering and laboratory evaluations of each plant.

An industrial waste inventory located and identified the significant industrial waste sources. No samples were taken. Technical Appendix III[1] contains the engineering evaluation reports for those industries visited.

Major Plants

Myrtle Grove, Palm Springs North Subdivision, Redlands Farm Labor Camp, Seaboard Industrial Park and South Dade Farm Labor Camp treatment plants achieved at least 90% removal efficiency for both biochemical oxygen demand (BOD) and total suspended solids (TSS).

Country Club of Miami, Atomic Sewerage, Doral Country Club, Pan American Hospital, Community Utilities and South Miami Heights treatment plants achieved 90% reduction of BOD but not total suspended solids.

Westwood Lakes Subdivision treatment plant achieved 90% reduction of total suspended solids but not BOD.

Andover, Carol City, Riverdale Estates, Golden Isles, Miami Lakes, Opa Locka Airport, Little Abner's Trailer Park, Peninsular Utilities, Southern Estates, Cutler Ridge, Bell Aire Subdivision, Homestead Air Force Base, City of Homestead, Leisure City and City

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1/ Published separately in limited edition.

of Miami (Virginia Key) did not achieve 90% reduction of either BOD or TSS.

North Miami and Miami Beach Ocean outfalls discharge 36.8 MGD into the Atlantic Ocean with only skimming to remove floatables.

Carol City, Myrtle Grove and Miami Lakes plants, handling 4.04 MGD with a reduction of 85.5% BOD and 79.6% TSS are to be abandoned, and their raw waste (7,619 lbs/day BOD and 8,920 lbs/day TSS) discharged into the Atlantic Ocean through the North Miami outfall.

Minor Plants

Food Fair Stores #291, Hialeah Hospital, Airport Lanes, Howard Johnson, My-Am-E Trailer Park, Jade Garden Apartments, Camp Matecumbe, Casa Granda Apartments, El Rancho Apartments, Redlands Mobile Home Park and Steak & Brew Restaurant treatment plants provide 90% reduction of both BOD and TSS for a total flow of 0.276 MGD.

Coast Guard Station, Del Ray Gardens, Hialeah City Hall, Holiday Inn, Midway Mall, Air Traffic Control, Blue Lake Trailer Park, Medley Mobile Park, 79th Street Shopping Center, American Hospital Supply, Country Club Gardens, Westchester Hospital, Goldberg Apartments, Ludlum Plaza Apartments, Kendale Lakes and Helman Court Apartments treatment plants provide 90% reduction of BOD but not TSS for a total flow of 0.354 MGD.

Palm Springs Hospital and Florida Portland Cement treatment plants provide 90% reduction of TSS but not BOD for a total flow of 0.019 MGD.

Shores Condominium, Dade Christian School, Barry College, Monsignor Pace High School, Palm Springs Gardens Condominium, Hialeah Convalescent Home, Kings Inn, Saratoga Springs Apartments, Queen's Inn, Miami Springs High School, Biltmore Hotel, Miller Lake Apartments, Lakeview Garden Apartments, Kendale Complex, Naval Air Station, Sweden House

Restaurant and Sea Glades Motel do not provide 90% reduction of either BOD or TSS. Total flow is 0.246 MGD.

Minor treatment plants handle less than 1% of Dade County's sewage flow. Only 22 minor plants have licensed operators or are operated by licensed consultants. Most minor plants have some operational difficulty which contributes to poor treatment efficiency. Small plants require a disproportionally large amount of labor and maintenance.

Major and minor wastewater treatment plants contribute the following waste loads to the waters of Dade County:

- Snake Creek Canal drainage area: 1,622 lbs/day BOD, 1,616 lbs/day TSS, 7.04 MGD.
- Biscayne Canal and Little River drainage area: 366 lbs/day BOD, 407 lbs/day TSS, 1.142 MGD.
- Miami River drainage area: 155 lbs/day BOD, 292 lbs/day TSS, 0.69 MGD.
- Coral Gables Waterway drainage area: 267 lbs/day BOD, 588 lbs/day TSS, 2.62 MGD.
- Snapper Creek Canal drainage area: 1,824 lbs/day BOD, 2,303 lbs/day TSS, 5.986 MGD.
- Black Creek Canal drainage area: 862 lbs/day BOD, 2,270 lbs/day TSS, 3.53 MGD.
- South Bay Area drainage area: 586 lbs/day BOD, 989 lbs/day TSS, 3.21 MGD.
- Atlantic Ocean or Biscayne Bay drainage area: 54,175 lbs/day BOD, 48,588 lbs/day TSS, 77.1 MGD.

Industrial Waste Sources

An initial list of over 1,800 industries was systematically reviewed and evaluated. No industrial discharges were sampled. Rather, a list of the 89 most significant industrial waste sources was compiled and reports were prepared as a guide to further work.

Fifteen industries discharge to surface waters, 36 to ground water and 38 to municipal sewer systems.

Industrial discharges to ground and surface water in and adjacent to the Hialeah-Miami Springs well field contains toxic substances, heavy metals, oil and petroleum derivatives, acids, alkalies, suspended solids and oxygen demanding materials.

Rule 7 of the Dade County Commission provides for the control of industrial waste discharges into municipal sewer systems.

Conclusions based on the findings of this study are:

1. Municipal wastes are contaminating the waters of Dade County.
2. Twenty one percent 62% (~~21%~~) of the municipal waste volume from Dade County receives inadequate treatment and 36% ~~77%~~ receives no treatment.
3. Small plants require disproportionally high labor and maintenance and in that respect are less efficient than larger conventional treatment plants.
4. Closing Carol City, Myrtle Grove and Miami Lakes plants without providing alternative treatment will increase the overall waste discharge load.
5. Industrial waste discharges are contaminating the waters of Dade County.
6. Industrial wastes may be contaminating the Miami Springs-Hialeah well field.
7. Industrial wastes may have a detrimental effect on the performance of sewage treatment systems.

8. Further study of industrial waste sources is needed to determine the full extent and nature of pollution from these sources.*

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* Industrial waste survey completed in June 1971.

RECOMMENDATIONS

In addition to recommendations made at previous conferences, it is further recommended that:

1. By January 1, 1974, a regional collection and treatment system to serve all waste sources in Dade County be in operation to ensure secondary treatment of all wastes, with removal efficiencies of not less than 90 percent, and with discharge of treated effluents to the Atlantic Ocean, at the edge of the Gulf Stream.

2. Environmental Protection Agency make a study of existing ocean outfalls and the coastal zone with a view toward recommending more detailed ocean disposal criteria. Preliminary disposal guidelines are to be reported to the Conferees by July 1, 1972.

3. Notwithstanding recommendation 1 above, no existing treatment facility should be abandoned when such action will result in a lower overall treatment efficiency. Rather the treated effluent should be discharged to the ocean outfall system until an adequate regional treatment system is provided.

4. All wastes being discharged through North Miami and Miami Beach ocean outfalls be given secondary treatment with removal efficiencies of not less than 90 percent by January 1, 1974.

5. The City of Miami, Virginia Key plant be upgraded to provide a BOD_5 and total suspended solids removal efficiency of 90 percent. The plant be expanded to provide additional flow capacity, and the existing ocean outfall be extended to the edge of the Gulf Stream.

6. Minor plants which will remain in operation until recommendation #1 is accomplished be required to:

a) Provide for leveling peak flows,
b) Provide multiple level digestion outlets,
c) Provide drains on all tanks to facilitate cleaning,
d) Provide and maintain reliable chlorine dosing equipment,
e) Provide and maintain flow meters,
f) Prohibit submersible pumps for feeding pressure filters,
g) Have licensed operators or be operated by licensed consultants, and
h) Collect and report operational data to the Florida Department of Air and Water Pollution Control.

MAJOR MUNICIPAL WASTE SOURCES

Twenty-seven major municipal wastewater treatment plants and two ocean outfalls were surveyed between November 28, 1970 and February 2, 1971. The location of each facility is shown in Figure 1. Twenty four-hour composite samples were collected from influent and effluent, each facility using automatic samplers. Laboratory analyses were conducted on influent and effluent for 5-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), total suspended solids (TSS), volatile suspended solids (VSS), total organic carbon (TOC), and settleable solids (SS). In addition, effluent samples were analyzed for nitrogen compounds, total phosphorus, and chlorides. Daily grab samples of the effluent after chlorination were analyzed for chlorine residual, pH, and total coliform bacteria and fecal coliform bacteria. Temperature and pH were measured in the field.

An inventory of major municipal wastewater sources is given in Table 1. Design information was obtained from the plant management,and, where possible, laboratory results were discussed with plant operators. Evaluation reports for each major waste source are included in Technical Appendix I. (Separate publication)

Five plants were operating satisfactorily. Six plants were hydraulically overloaded, but removal efficiencies were affected in only three of these plants. Flow meters malfunctioned in six plants; seven did not provide adequate chlorination; five require additions to or enlargement of treatment facilities.

Tables A-1 through A-5 provide detailed information on average influent and effluent concentrations, removal efficiencies, and effluent loads for the various parameters. Table 2 is a summary of discharged loads for each drainage basin. A discussion of significant problems associated with the individual waste sources in each drainage area, follows:

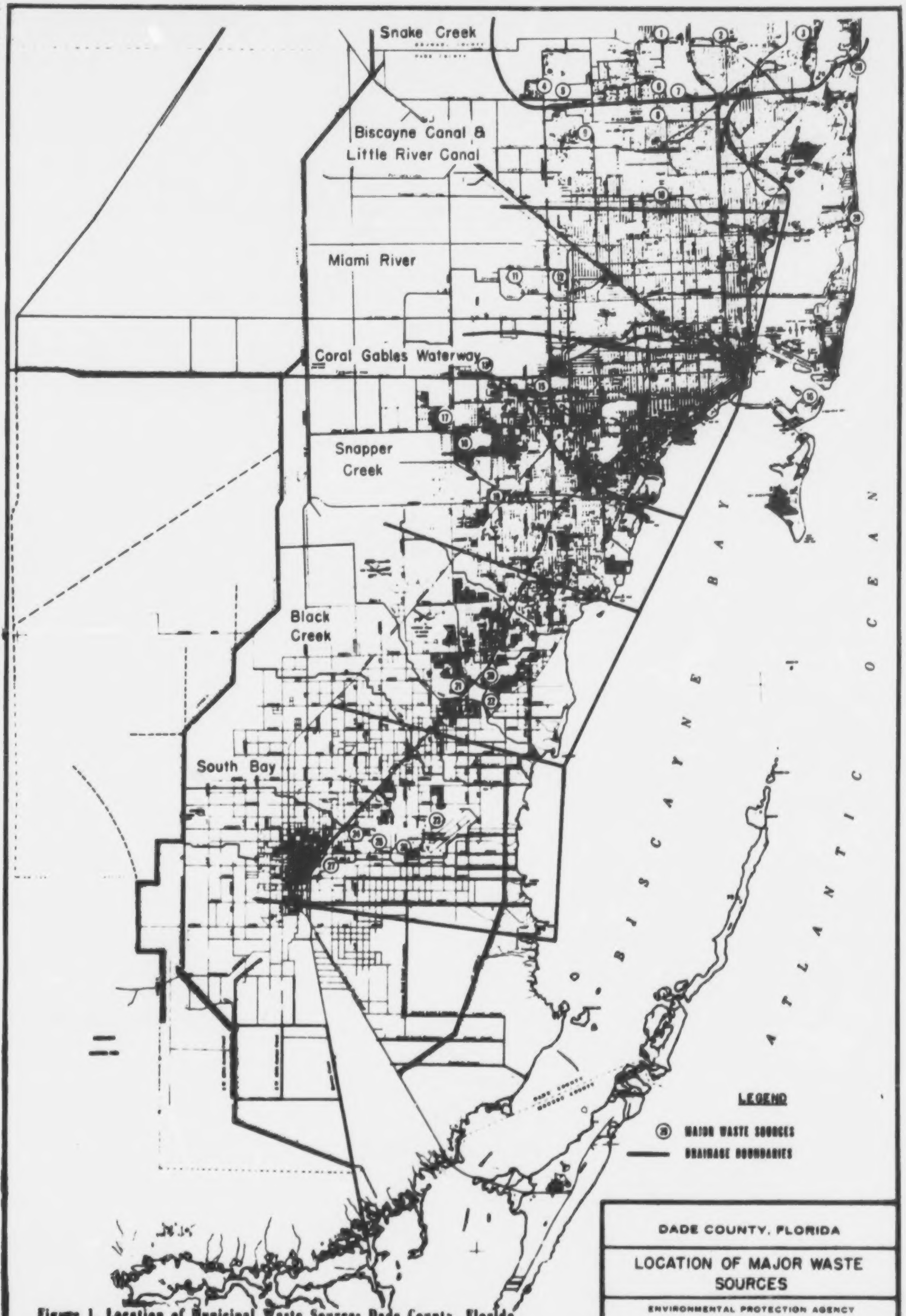
Snake Creek
Biscayne Canal & Little River Canal
Miami River
Coral Gables Waterway
Snapper Creek
Black Creek
South Bay
BISCAYNE BAY
ATLANTIC OCEAN
LEGEND
MAJOR WASTE SOURCES
DRAINAGE BOUNDARIES
DADE COUNTY, FLORIDA
LOCATION OF MAJOR WASTE SOURCES
ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE
DIVISION OF FIELD INVESTIGATIONS - DENVER CENTER

Figure 1. Location of Municipal Waste Sources Dade County, Florida

Table 1.--Summary of Inventory Information and Abatement Needs for Major Waste Treatment Plants in Dade County, Florida

Map Key 1/	Name of Source and Address	Actual Flow Design	Actual Flow Actual	Population Served	Removal Efficiency % BOD	Type of Treatment 2/	Effluent Discharged to	Remarks and Abatement Needs
	Snake Creek Drainage							
2	Andover NW 2nd Ave. and 200th St.	1.700	1.714	8,600	84.0	Comm., comp. mix act. sludge, microstrainer, 2-stage aerobic digestor, sludge dewater	Snake Creek	Correction of flow meter.
6	Carol City 3801 NW 131st St.	3.500	2.030	17,000	82.5	Comm., pri. clar., comp. mix act. sludge 2-stage aerobic digestor, liquid sludge disposal	Carol City Canal	Plant scheduled to be abandoned during 1971.
1	Riverdale Estates 3150 NW 206th Terrace	0.875	0.362	3,500	85.6	Comm., comp. mix act. sludge, aerobic digestor liquid sludge, disposal	Snake Creek	Additional treatment facilities.
3	Golden Isles 2459 NE 204th St.	0.500	0.642	6,000	82.4	Prechlorination, cont. stab., reaeration, (diffused air) 2-stage aerobic digestor, sludge drying	Oleta River	Enlargement of facilities, additional facilities, improved chlorination.
7	Myrtle Grove - City of N. Miami Beach NW 179 St. and NW 21st	4.000	1.645	21,000	91.8	Grit chamber, pri. clar., comp. mix act. sludge, anaerobic digestor, liquid sludge disposal	Carol City Canal B	Plant scheduled to be abandoned during 1971.
5	Country Club of Miami 6601 NW 186th St.	0.200	0.165	2,000	94.5	Bar screening, cont. stab., reaeretion (diffused air), 2-stage aerobic digestor, liquid sludge	77th Ave. Canal	Improved lagoon maintenance.
4	Palm Springs North S.D. 7900 NW 176th St.	0.750	0.447	6,000	92.3	Bar screen, pri. clar., act. sludge (diffused air), Jetflo system, anaerobic digestor, sludge drying beds	77th Ave. Canal	None

Table 1.--Summary of Inventory Information and Abatement Needs for Major Waste Treatment Plants in Dade County, Florida--Continued

Map Key[1/]	Name of Source and Address	Actual Flow Design	Actual Flow Actual	Population Served	Removal Efficiency % BOD	Type of Treatment[2/]	Effluent Discharged to	Remarks and Abatement Needs
	Biscayne Canal and Little River Canal Drainage							
9	Miami Lakes Utilities 14045 NW 67th Ave.	0.950	0.727	1,330	79.8	Comm., diffused air, reaeration, aerobic digestor, sludge disposal	138th Street Canal	Plant scheduled to be abandoned during 1971.
10	Seaboard Industrial Park NW 112th St. and 36th Ave.	0.174	0.117	NA[3/]	95.0	Bar screen, comp. mix. act sludge aerobic digestor, sludge drying beds	Little River Canal	None.
8	Opa Locka Airport - Dade County Port Authority	1.500	.133	NA[3/]	82.0	Bar screen, pri. clar., trick filter, aerobic digestor, sludge drying beds	Biscayne Canal	Improved chlorination, improved lift stations.
	Miami River Drainage							
12	Atomic Sewerage 6900 NW 58th St.	0.072	0.024	NA[3/]	89.9	Surge tank, pri. clar., diffused air, 3-cell. oxid. lagoon, anaerobic digestor, sludge drying beds	F.E.C. Canal	None.
11	Doral Country Club NW 50th St. and 92nd Ave.	0.170	0.215	1,500	90.1	Diffused air, reaeration, aerobic digestor, sludge drying beds	Dressels Dairy Canal	Addition of flow meter, improved chlorination, operator training, improved laboratory.
	Coral Gables Waterway							
13	Lil' Abner Trailer Park 11165 W. Flagler St.	0.150	0.072	1,600	84.1	Comm., diffused air, reaeration, oxid. lagoon, aerobic digestor, liquid sludge disposal		Improved laboratory, operator training.
14	Pan American Hospital 5959 NW 7th St.	0.036	0.036	NA[3/]	97.8	Surge tank, diffused air, equal. tank, Jetflo system, liquid sludge disposal	Tamiami Canal	Additional treatment facilities.

Table 1.--Summary of Inventory Information and Abatement Needs for Major Waste Treatment Plants in Dade County, Florida--Continued

Map Key 1/	Name of Source and Address	Actual Flow		Population served	Removal Efficiency % BOD	Type of Treatment 2/	Effluent Discharged to	Remarks and Abatement Needs
		Design	Actual					
15	Community Utilities 7811 SW 23rd St.	2.050	2.471	21,800	94.4	Pri. clar., comp. mix act. sludge, liquid sludge disposal	Feeder Canal to Coral Gables Waterway	Plant scheduled to be abandoned during 1971.
	Snapper Creek Drainage							
19	Peninsular Utilities SW 97th Ave. and Kendall Dr.	3.000	2.500	25,700	89.5	Comm., pri. clar., comp. mix act. sludge, sludge thick. tank, 2-stage aerobic digestor, liquid sludge disposal	Snapper Creek	None.
17	Southern Estates 11955 SW 34th St.	1.050	1.428	2,500	76.1	Comm., comp. mix act. sludge, 30% to clar., trick. filter aerobic digestor, sludge drying beds	Feeder Canal to Snapper Creek	Elimination of infiltration
18	Westwood Lakes 4801 SW 117th Ave.	2.6	1.970	22,700	74.0	1. pri. clar., trick. filt. 2. Comp. mix act. sludge, stabilization tank, 2-stage aerobic, liquid sludge disposal	Snapper Creek	Improved operation.
	Black Creek Drainage							
21	South Miami Heights SW 117th Ave. and U.S. Hwy. 1	1.750	1.089	13,000	92.2	Comm., pri. clar., diffused air, 2-stage aerobic digestor, liquid sludge removal	Feeder Canal to Black Creek	Additional flow meter, outfall modification.
22	Cutler Ridge Anchor Road and Puerto Rico Terrace	4.000	2.195	20,000	86.5	Comp. mix act. sludge, 2-stage aerobic digestor sludge drying beds	Bell-Aire Canal	Improved chlorination
20	Bell-Aire S.D. Quail Roost and U.S. Hwy. 1	0.525	0.423	5,000	77.8	Comm., grit chamber, pri. clar. tick. filter, microstrainer, sand filter, aerobic digestor, liquid sludge disposal	Bell-Aire Canal and subsurface	Improved chlorination.

Table 1.--Summary of Inventory Information and Abatement Needs for Major Waste Treatment Plants in Dade County, Florida--Continued

Map Key[1/]	Name of Source and Address	Actual Flow Design	Actual Flow Actual	Population served	Removal Efficiency % BOD	Type of Treatment[2/]	Effluent Discharged to	Remarks and Abatement Needs
	South Bay Drainage							
23	Homestead Air Force Base Homestead Air Force Base	1.150	2.116	2,000	63.7	Pri. clar., trick. filt., anaerobic digestor, sludge drying beds	Military Canal	Elimination of infiltration, operator training, improved laboratory support, additional treatment facilities.
27	City of Homestead SW 328th St. and U.S. Hwy. 1	1.950	0.893	10,000	82.7	1. Pri. clar., trick. filt. 2. Diffused air, anaerobic, aerobic digestors, sludge drying beds	C-103 Canal	Calibration of flow measuring device.
26	South Dade Labor Corp. SW 312th St. and SW 147th Ave.	0.100	0.126	1,350	93.9	Imhoff tank, trick. filter, microstrainer	Feeder Canal to C-103 Canal	Flow meter modification laboratory facilities, improved chlorination, operator training. Plant design review.
24	Redlands Labor Camp 29355 S. Federal Hwy.	0.100	0.057	1,250	90.6	Imhoff tank, trick. filter, microstrainer	Subsurface	Repositioning of flow meter, laboratory facilities, improved chlorination, operator training plant design review.
25	Leisure City Kings Hwy. and Naraja Road	0.630	0.296	9,000	86.8	Comm., mech. aeration, re-aeration, sand filters, 2-stage aerobic digestor sludge drying beds	Subsurface	Improved operation.
	Atlantic Ocean							
16	Virginia Key-City of Miami Virginia Key	47.00	40.30	500,000	79.3	Aerated grit chamber, diffused air high-rate act. sludge, sludge drying beds	Biscayne Bay	Additional treatment facilities, improved chlorination. Additional treatment.

Table 1.--Summary of Inventory Information and Abatement Needs for Major Waste Treatment Plants in Dade County, Florida--Continued

Map Key[1]	Name of Source and Address	Actual Flow Design	Actual Flow Actual	Population Served	Removal Efficiency % BOD	Type of Treatment[2]	Effluent Discharged to	Remarks and Abatement Needs
28	North Miami	-	-	-	-	Preliminary Treatment[4]	Atlantic Ocean	Additional Treatment
29	Miami Beach	-	-	-	-	Preliminary Treatment[4]	Atlantic Ocean	Additional Treatment
	Sunny Isles[5]	-	-	-	-	Preliminary Treatment[4]	Atlantic Ocean	Additional Treatment

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[1] Refers to numbered locations shown in Figure 1.
[2] Includes secondary clarification and disinfection.
[3] Not applicable.
[4] Preliminary Treatment consists of skimming floatable solids in a primary clarifier. The settled sludge is recombined with the supernatant.
[5] Discharges through North Miami outfall.

Table 2.--Total Loads of Pollutants Discharged by Major Municipal Waste Sources, Dade County, Florida

Drainage System	Number of plants	Flow MGD	BOD lb/day	COD lb/day	TSS lb/day	VSS lb/day	TOC lb/day	Kjeldahl N lb/day	Ammonia N as N lb/day	Organic N as N lb/day	NO_2+NO_3 as N lb/day	Total P lb/day
Snake Creek Drainage	7	7.025	1,553	5,722	1,615	1,868	1,708	1,060	884	176	227	582
Biscayne Canal and Little River Drainage	3	1.027	344	2,629	366	214	461	119	92	29	48	101
Miami River Drainage	2	.239	75	416	135	101	114	23	11	12	3	15
Coral Gables Waterway	3	2.579	264	1,270	571	454	352	331	312	20	94	159
Snapper Creek Drainage	3	5.898	1,814	5,610	2,291	1,947	1,723	1,001	856	150	14	493
Black Creek Drainage[1/]	3	3.453	857	2,287	2,264	1,993	860	408	327	81	29	322
South Bay Drainage[1/]	3	3.135	575	1,998	948	403	632	178	125	52	163	219
Atlantic Ocean	3	77.100	54,164	220,441	48,561	54,558	35,402	13,105	9,263	3,842	32	5,108

[1/] does not include plants discharging to ground water.

Snake Creek Drainage

The Andover wastewater treatment plant provided 84% reduction of BOD_5 and 83 % reduction of total suspended solids. This plant is hydraulically overloaded at peak flows because of infiltration in the collection system. Scum and heavy foam from the aerators are carried over into the microstrainer. Laboratory results vary widely, indicating inconsistent operation.

Daily BOD removal efficiencies at the Carol City wastewater treatment plant varied from 73.5 % to greater than 97.3 %, and suspended solids removal efficiencies varied from 61.3 % to 91.5%. Standard procedure was to operate only three of four mechanical aerators in each aeration tank. Chlorination of the influent was practiced during part of the survey. Analysis by plant personnel indicated inadequate aeration when operating only three mechanical aerators and inadequate settling in the secondary clarifiers. Four mechanical aerators are now reportedly operating in each aeration tank, and alum is introduced prior to the secondary clarifiers to improve settling. No retesting by EPA has been done nor is any anticipated.

The Riverdale Estates wastewater treatment plant provided an average of 85.6% reduction of BOD_5 and 32.6% reduction of total suspended solids. This plant received a strong waste --- BOD_5 of 456 mg/1 and total suspended solids of 369 mg/1. Chlorine residuals averaged 6.8 mg/1 and average pH of the effluent was 4.6 (excessive chlorination). Operating adjustments should be made to compensate for the strong waste and reduce chlorination to an effective level which will not alter the pH.

Although the Myrtle Grove wastewater treatment plant received an estimated 0.25 MGD of industrial waste which in the past have interfered with treatment, 90% BOD_5 and suspended solids removals were measured during the survey.

Major Industrial Wastewater Discharges to the Myrtle Grove Wastewater Treatment Plant

Industry	Products or Processes	Water Use[1/] Gallons per Month
Aluminine, Inc.	Aluminum grills	184,000
Anodyne	Lithograph and silk screens	930,000
Atlas Metal Industry, Inc.	Computer and Food Processing Equipment	808,000
Miller Industry, Inc.	Aluminum sliding doors grills, etc.	325,000
Perkins Marine Lamp & Hardware Corp.	Marine Hardware	1,379,000
Sealtest Food Products	Dairy Products	3,087,000
Velda Farms	Dairy Products	--

1/ Water use figures supplied by the North Miami Beach Utilities, Water Department.

The Golden Isles waste treatment plant provided 82% and 80% removal of BOD_5 and suspended solids, respectively. This plant was hydraulically and organically overloaded. Designed for a daily flow of 0.5 MGD and a BOD loading of 850 pounds per day, the plant was receiving an average flow of 0.642 MGD and a BOD_5 load of 1,000 pounds per day.

The Country Club of Miami wastewater treatment plant provided 95% reduction of BOD_5. A private laboratory reported 90% reduction of total suspended solids in the mechanical treatment plant. Lower Florida Estuary Study testing showed 85% reduction of TSS based on effluent from the polishing pond. This difference is probably due to the growth of algae in the pond.

The Palm Springs North wastewater treatment plant provided 93% reduction of BOD_5 and 98% reduction of total suspended solids from an average daily flow of 0.45 MGD.

The Carol City and Myrtle Grove plants are to be abandoned in 1971, and their raw wastes diverted to the North Miami ocean outfall. The BOD_5 loading to Snake Creek will be reduced by approximately 800 pounds per day, with proportionate reductions in other pollutants. Abandonment of these treatment plants is inconsistent with the Conference recommendation that a minimum of secondary treatment, with at least 90% BOD_5 removal and year-round chlorination of effluent, be provided all waste before discharge to the ocean. The North Miami discharge has no treatment other than skimming. These two plants should remain in operation with their treated effluent discharged through the ocean outfall until other provisions for adequate treatment are made.

Biscayne Canal and Little River Drainage

The Miami Lakes Utilities wastewater treatment plant removed 79.8% BOD_5 and 70.9% suspended solids. This plant received industrial wastes from 21 industries in the Miami Lakes Industrial Park. At the time of the survey, plant management had no assessment of the quality or quantity of the industrial fraction. Subsequently, steps have been taken to improve operations and to pretreat certain industrial wastes.

The Seaboard Industrial Park wastewater treatment provided an average of 95% reduction of BOD_5 and 95.2% reduction of total suspended solids from a flow of 0.12 MGD.

The Opa Locka Airport wastewater treatment plant provided 82% reduction of BOD_5 and 87 % reduction of total suspended solids from a flow of 0.18 MGD. The effluent carried no chlorine residual and bacteria population densities averaged 640,000 per 100 ml of total coliform bacteria and 155,000 per 100 ml of fecal coliform bacteria.

All three of these plants are to be abandoned and the raw waste diverted to the North Miami outfall. Such action is inconsistent with the Conference recommendation of a minimum of secondary treatment prior to ocean disposal. These plants should remain in operation with their treated effluent discharged to the ocean outfall until other provisions for adequate treatment are made.

Miami River Drainage

The Atomic Sewerage plant has an activated sludge process designed to process septic tank pump-out waste. Incoming waste strength averaged 1126 mg/l BOD_5 and 1,348 mg/l TSS. Removal efficiency averaged 90% for BOD_5 and 89% for total suspended solids.

The Doral Country Club wastewater treatment plant provided 90% reduction of BOD_5 and 57.6% reduction of total suspended solids. Treated effluent flow into a lake on the Club property and was subsequently used to irrigate the golf course. Dried sludge was used for fertilizer.

The Little Abner's Trailer Park wastewater treatment plant obtained 84% reduction of BOD_5 and 79% reduction of total suspended solids from a flow of 72,000 gallons per day.

The Pan American Hospital wastewater treatment plant provided 97.8% reduction of BOD_5 and 60% reduction of total suspended solids. Erratic suspended solids removal was caused by carryover of a floc formed in the chlorine contact chamber after chlorination. Modifications to permit chlorination prior to tertiary treatment were being made in an attempt to correct this problem. No current information on the results of that attempt are available.

Coral Gables Waterway Drainage

The Community Utilities wastewater treatment plant discharged 230 pounds per day BOD_5 and 499 pounds per day suspended solids to the Coral Gables waterway. A BOD_5 reduction of 94.4% was being achieved. This plant is to be abandoned, with the raw waste flowing to Virginia Key.

Snapper Creek Drainage

The Peninsular Utilities plant removed 89.5% BOD_5 and 88.9% suspended solids from a 2.5 MGD flow. In early 1971, the plant initiated a deep-well injection system.

Low removal efficiencies by the Southern Estates wastewater treatment plant (76.1% BOD_5 and 69.7% suspended solids) was attributed to an extreme hydraulic overload, (140% of design flow) . Excess flow was attributed to infiltration (verified by the low influent BOD_5 concentration of 134 mg/1). This problem can be corrected by either elimination of infiltration, or expansion of treatment facilities.

The Westwood Lakes wastewater treatment plant removed 74% and 94.3% of BOD_5 and suspended solids, respectively. Recent modifications to the treatment process resulted in instability. No re-evaluation was done nor is any planned.

Black Creek Drainage

The Cutler Ridge wastewater treatment plant removed 86.5% BOD_5 and 73.8% suspended solids. Mechanical difficulties with a secondary clarifier reduced average removal efficiencies.

The Bell Aire wastewater treatment plant removed 77.8% BOD_5 and 89.5% suspended solids. Plans have been initiated to provide an activated sludge unit, but have been suspended pending clarification of discharge requirements.

The South Miami Heights wastewater treatment plant provided 91% reduction of BOD_5 and 85% reduction of total suspended solids. A slug of waste from a sewer cleaning project was received at the outset of the study, and this contributed to the poor solids removal. During the last three days of the study, operation stabilized and removal efficiencies were well above 90% for both BOD_5 and TSS.

South Bay Drainage

The Homestead Air Force Base wastewater treatment plant was hydraulically overloaded. Designed for 1.0 MGD, it receives approximately 2.5 MGD during winter and 3.0 MGD during summer. Removal efficiencies were 63.7% for BOD_5 and 76.0% for suspended solids. Primary and secondary clarifiers are to be expanded and sand filters added.

The City of Homestead wastewater treatment plant provided 82.7% reduction of BOD_5 and 84.7% reduction of total suspended solids from 0.873 MGD. Although the effluent carried a chlorine residual, total coliform bacterial population densities of up to 130,000 per 100 ml indicated incomplete disinfection.

The South Dade Farm Labor Camp wastewater treatment plant achieved 93.9% reduction of BOD_5 and 98.7% reduction of total suspended solids from a flow of 0.126 MGD.

The Redlands Labor Camp wastewater treatment plant achieved the highest treatment efficiency of all major plants with 96.6% reduction of BOD_5 and 96% reduction of total suspended solids. The flow was 57,000 gallons per day. Influent waste strength was high with a BOD_5 of 969 mg/1 and TSS of 1,332 mg/1. The plant is a conventional trickling filter system followed by a microstrainer. Effluent is discharged to sand filters and returned to ground water.

The Leisure City wastewater treatment plant provided 86.8% reduction of BOD and 81.2% reduction of total suspended solids from 0.296 MGD.

Direct Ocean Discharge

The City of Miami Virginia Key plant treated approximately 40 MGD with a removal efficiency of approximately 80% BOD_5 and 90% suspended solids reduction. The plant, designed for 75% BOD_5 reduction, should be upgraded to provide 90% BOD_5 and TSS removal and expanded to provide additional flow capacity. The ocean outfall should be extended to the edge of the Gulf Stream.

The North Miami and Miami Beach ocean outfalls discharged approximately 15 and 22 MGD, respectively, of wastewater with limited treatment (skimming). Ninety percent treatment recommended by the Conferees would reduce the BOD_5 loading by approximately 33,000 pounds per day.

MINOR MUNICIPAL WASTE SOURCES

Forty-seven minor municipal waste sources were surveyed between December 2, 1970 and February 2, 1971. Four additional plants were inventoried but were not sampled because they were new installations which had not reached operational stability. The location of each plant is shown in Figure 2. Grab samples were collected from influent and effluent and analyzed for 5-day biochemical oxygen demand (BOD_5),chemical oxygen demand (COD), total organic carbon (TOC), total suspended solids (TSS), volatile suspended solids (VSS), and settleable solids. Additionally, effluent samples were analyzed for nitrogen compounds, total phosphorous and chloride. Temperature, chlorine residual and flow were determined in the field.

An inventory of minor municipal plants is given in Table 3 and a summary of analytical results is presented in Tables A-6 through A-10. Individual evaluation reports on each plant were prepared and are compiled in Technical Appendix II. Plant performance was considered satisfactory if 90% reduction of BOD_5 and TSS was provided.

Of the 47 minor wastewater treatment plants in Dade County, 21 plants discharged to the surface water and 26 plants discharged to the ground. The total flow from these plants was 0.915 MGD.

Only 13 plants met treatment criteria for both BOD_5 and suspended solids removal. Nineteen plants, accounting for 0.634 MGD, provided greater than 90% removal of BOD_5, but only 13 plants, accounting for 0.294 MGD, provided greater than 90% removal of TSS. Only 22 plants had licensed operators or were operated by licensed consultants.

Atlantic Ocean and Biscayne Bay Drainage Area

The Coast Guard Base wastewater treatment plant received an average flow of 0.014 MGD and was hydraulically overloaded by 44%. The BOD_5 removal efficiency was 95%; TSS removal was 28%. The plant did not meet the treatment criteria. Chlorine residual was 1.0 mg/l. This plant had a licensed operator.

The Shores Condominium wastewater treatment plant produced 82.3% BOD_5 removal and 60% total suspended solids removal. This plant did not meet the treatment criteria. Chlorine residual was 2.0 mg/l.

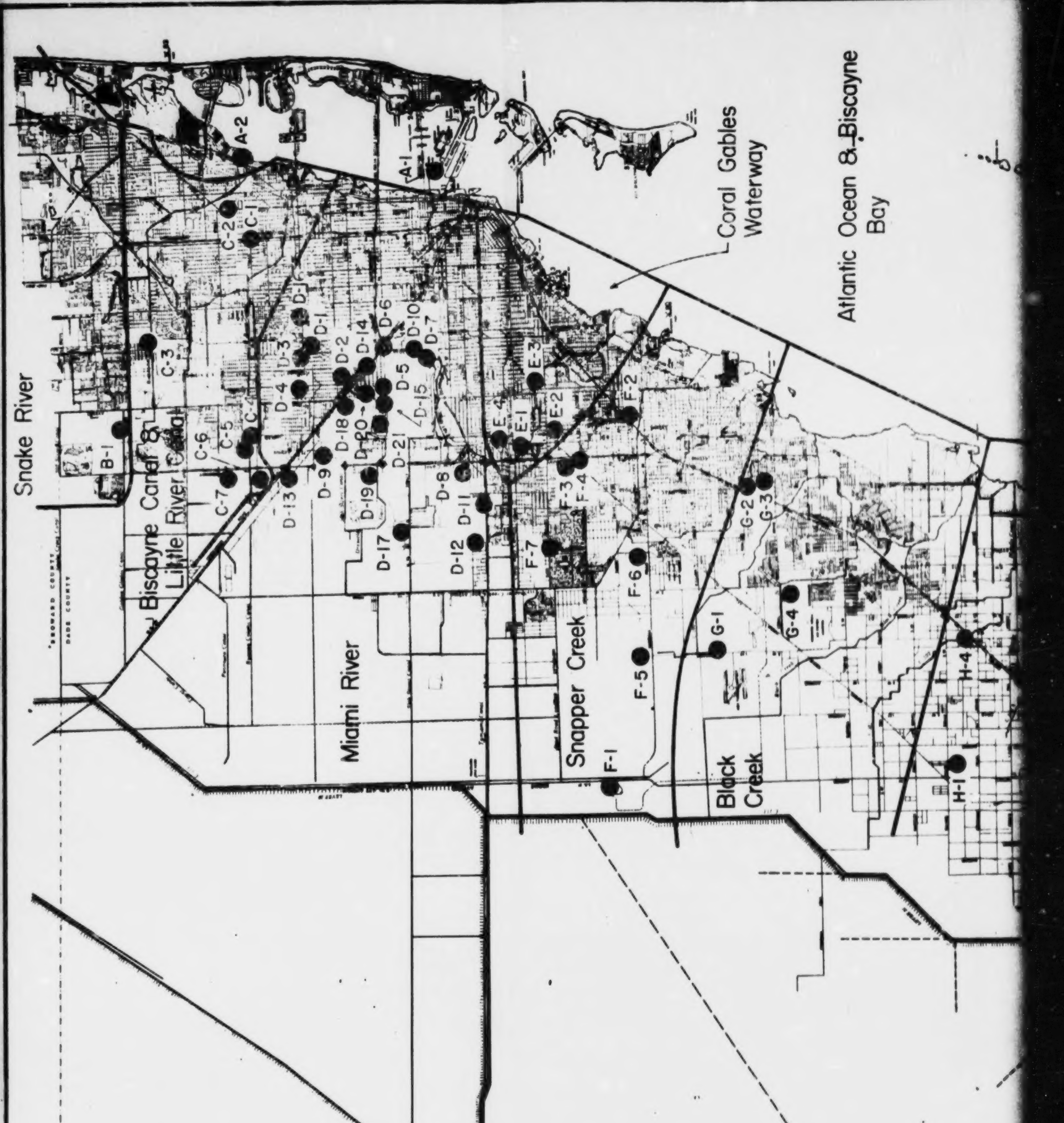
Snake Creek Drainage Area

The Dade Christian Schools treatment plant discharged to the 205th Street Canal after 69% BOD_5 removal and 81.9% TSS removal. It did not meet the treatment criteria. An extremely high concentration of nitrite-nitrate nitrogen, 136 mg/l, was discharged. Chlorine residual was 0.5 mg/l. The plant operator was not licensed.

Biscayne Canal and Little River Drainage Area

Six minor wastewater treatment plants in the Biscayne Canal and Little River drainage area were sampled. Food Fair Store #291 and Barry College plants discharged to the ground through drainfields. Monsignor Pace High School plant discharged to the Biscayne Canal. Del Rey Gardens Condominium, Palm Springs General Hospital, and Palm Springs Garden Condominium plants discharged to Little River.

The Barry College, Monsignor Pace High School, Palm Springs Garden Condominium, Del-Rey Gardens, and Palm Springs Hospital plants did not provide 90% removal of BOD_5 and/or TSS. All plants had chlorine residuals greater than 1.8 mg/l except Barry College which had no chlorine residual. Three operators were licensed.


Snake River
Biscayne Canal & Little River Canal
Miami River
Snapper Creek
Black Creek
Coral Gables Waterway
Atlantic Ocean & Biscayne Bay
BROWARD COUNTY
DADE COUNTY
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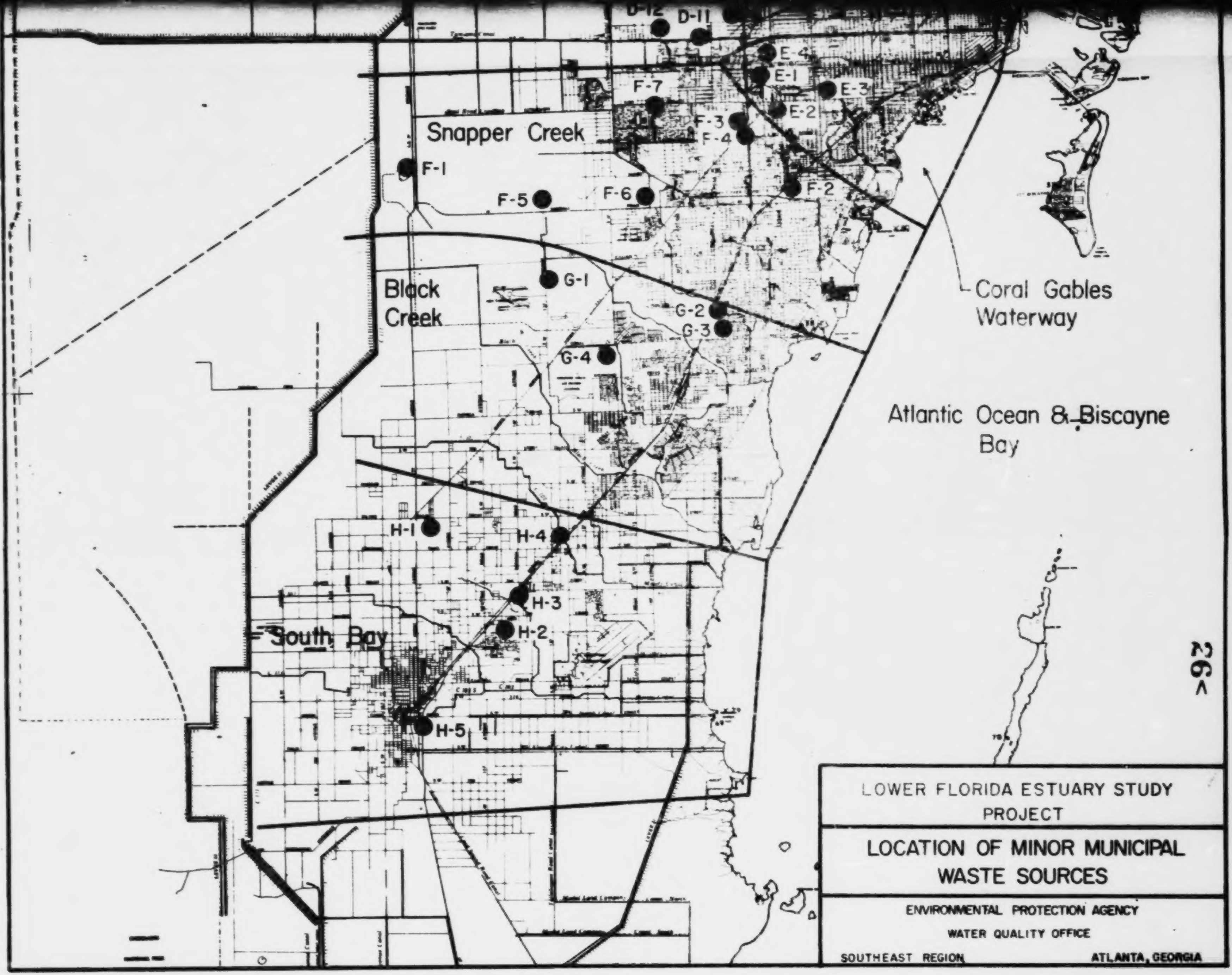
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Snapper Creek
F-1
F-5
F-6
F-2
Coral Gables Waterway
Black Creek
G-1
G-2
G-3
G-4
Atlantic Ocean & Biscayne Bay
H-1
H-4
H-3
H-2
South Bay
H-5
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LOWER FLORIDA ESTUARY STUDY PROJECT

LOCATION OF MINOR MUNICIPAL WASTE SOURCES

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE
SOUTHEAST REGION ATLANTA, GEORGIA

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida

	Name of Source and Address	Average Flow Design	Average Flow Actual	Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
A.	Atlantic Ocean and Biscayne Bay							
A-1	Coast Guard Station 100 McArthur Causeway Miami	.01	.0144	200	97.9	Extended Aeration	Government Cut	Plant expansion - hydraulic overload problem - increased solids removal.
A-2	Shores Condominium 1700 N.E. 105th Street North Miami	.02	-	200	82.3	Rapid Block	Biscayne Bay	Licensed operator required.
B.	Snake Creek							
B-1	Dade Christian Schools 6601 N.W. 167th Street Carol City	.07	.015	2,000	69.1	Extended Aeration, tertiary filter	205th Street Canal	Severe underload compensation.
C.	Biscayne Canal and Little River							
C-1	Food Fair Store #291 10400 N.W. 7th Avenue Miami Shores	.015	-	-	98.9	Extended Aeration	Drainfield	-
C-2	Barry College 11300 N.E. 2nd Avenue North Miami	.06	.03	1,400	85.8	Extended Aeration	Drainfield	Chlorination.
C-3	Monsignor Pace High School 15600 N.W. 32nd Avenue Opa Locka	.03	-	750	86.9	Extended Aeration	Biscayne Canal	Licensed operator required. Improved maintenance.

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow		Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
		Design	Actual					
C.	Biscayne Canal and Little River (Continued)							
C-4	Del-Ray Gardens 1255 W. 49th Place Hialeah	.040	.006	484	94.4	Contact Stabilization	Little River	Phased out.
C-5	Palm Springs Hospital 1479 W. 49th Street Hialeah	.050	.014	239 (Beds)	80.9	Extended Aeration	Little River	-
C-6	Palm Springs Garden Condominium 170 Royal Palm Road Hialeah Gardens	0.05	0.02	450	76.8	Contact Stabilization	Little River	-
C-7	Palmetto General Hospital Palmetto By-Pass & N.W. 122nd St. Hialeah	.036	-	-	-	Contact Stabilization, tertiary filters	Gratiguy Canal	Recently put in operation.
D.	Miami River							
D-1	Winn Dixie Stores 1051 S.E. 8th Street Miami	.04	-	-	-	Complete Mix, tertiary filters	Soakage pit	Soon to be phased out.
D-2	Hialeah City Hall 501 Palm Ave., Hialeah	.04	-	550	90.4	Rapid Bloc, tertiary filters	Drainfield	-
D-3	Hialeah Hospital 651 E. 25th Street Hialeah	.09	-	250 (Beds and staff)	92.2	Extended Aeration and contact stabilization, open sand filters	Drainfield	Licensed operator required.
D-4	Hialeah Convalescent Home 190 W. 28th Street Hialeah	.025	-	350	69.1	Contact stabilization	2 Drainfields	Improved maintenance.
D-5	Kings Inn 500 Deer Run Virginia Gardens	.02	-	110 (Rooms)	84.0	Rapid Bloc	Drainfield	Licensed operator.

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow Design	Average Flow Actual	Population Served	Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
	D. Miami River (Continued)							
D-6	Holiday Inn 1111 S. Royal Poinciana Blvd. Miami	.025	-	162	98.7	Extended Aeration	Miami Canal	-
D-7	Airport Lanes 1850 N.W. 42nd Avenue Miami	.022	.011	240	97.2	Extended Aeration	Tamiami Canal	-
D-8	Midway Mall West Flagler St. & Palmetto Expressway, Miami	.12	.06	84 Stores	98.3	Contact Stabilization	North Line Canal	-
D-9	Air Traffic Control 7500 N.W. 58th Street Medley	.009	-	400	99.5	Rated Aeration	58th Street Canal	-
D-10	Howard Johnson's 1980 N.W. Le Jeune Road Miami	.025	-	-	97.9	Contact stabilization	Tamiami Canal	Adequate operation.
D-11	My-Am-EE Mobile Home Park 9000 S.W. Grand Canal Drive Miami	.03	-	196 Sites	96.3	Extended Aeration, oxidation ponds	Tamiami Canal	-
D-12	Blue Lakes Trailer Park S.W. 102nd Ave. and West Flagler St., Miami	.034	-	241 Sites	98.0	Extended Aeration	Tamiami Canal	-
D-13	Medley Mobile Home Court 8181 South River Drive Medley	.035	.003	315	95.9	Contact Stabilization, tertiary filters	Soakage pit	Licensed operator required.
D-14	Saratoga Springs Apartments 400 N. Poinciana Blvd. Hialeah	.013	-	250	52.2	Extended Aeration	Drainfield	Licensed operator required.

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow		Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
		Design	Actual					
	D. Miami River (Continued)							
D-15	Queens Inn Hotel 5335 N.W. 36th Street Virginia Gardens	.016	-	320	86.3	Extended Aeration, tertiary filters	Drainfield	-
D-16	79th Street Shopping Center 3015 N.W. 79th Street Miami	.045	-	450	92.8	Extended Aeration, tertiary filters	Drainfield	Licensed operator required.
D-17	American Hospital Supply N.W. 97th Ave. and 25th St. Miami	.10	-	150	93.2	Contact stabilization, tertiary filters	N.W. 25th Street Canal	-
D-18	Miami Springs High School 750 Dove Avenue Miami Springs	.02	-	-	71.8	Complete Mix	Drainfield	Surge problem.
D-19	Country Club Garden Apartments N.W. 79th Ave. and 41st St. Medley	.14	.02	1,520	98.5	Contact stabilization, tertiary filters	Private lake	-
D-20	Fair Havens Retirement Home Morningside and Reinette Miami Springs	.030	-	-	-	Contact stabilization. Jetflo filters	Soakage pit	Recently put in operation.
D-21	Virginia Gardens Apartments 6055 N.W. 37th St. Virginia Gardens	.004	-	-	-	Extended Air tertiary filters	Soakage pit	Recently put in operation.
	E. Waterway Basin							
E-1	Westchester Hospital 7500 Coral Way Coral Gables	.03	.015	100 (Beds & staff)	97.8	Extended Aeration	Coral Gables Canal	Licensed operator required.

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow		Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
		Design	Actual					
E-2	Goldberg Apartments 6775 S.W. 44th St. South Miami	.01	-	120	96.0	Extended Aeration tertiary filter	Soakage pit	-
E-3	Biltmore Hotel 1200 Anastasia Avenue Coral Gables	.30	-	100	88.0	Trickling Filter	Coral Gables Canal	Severe underload.
E-4	Ludlam Plaza Apartments Ludlam Road and S.W. 15th St. South Miami	.0125	-	155	99+	Extended Aeration	Drainfield	-
F.	**Snapper Creek**							
F-1	Florida Portland Cement Krome Ave. and S.W. 64th St. Westwood Lakes	.0045	-	130	89.6	Imhoff Tank trickling filter	Drainfield	-
F-2	Jade Garden Apartments S.W. 65th Ave. and U.S. 1 South Miami	.0385	-	200	99.1	Contact stabilization	Snapper Creek Canal	Licensed operator required.
F-3	Miller Lake Apartments 5500 S.W. 77th Court Westwood Lakes	.05	.003	500	70.9	Contact stabilization, tertiary filters	Soakage pit	-
F-4	Lakeview Gardens Apartments 7711 Miller Drive Westwood Lakes	.03	-	300	89.0	Contact stabilization	Drainfield	Licensed operator required.
F-5	Kendale Lakes S.W. 147th Ave. and Kendale Dr. Kendale	.50	0.05	-	96.9	Contact stabilization	Lindgrin Road Canal	-
F-6	Kendale Complex 8500 S.W. 107th Ave. Kendale	.135	-	-	85.0	Imhoff Tank trickling filter oxidation pond	Drainfield	-
F-7	Caravel West Apartments Bird Road and 102nd Ave. Westwood Lakes	.020	-	-	-	Extended Air Tertiary filters	Soakage pit	Recently put in operation.

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow Design	Average Flow Actual	Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
G.	Black Creek							
G-1	Camp Matecumbe S.W. 120th St. and 137th Ave. Aladin City	.035	-	70	94.5	Extended Aeration, open sand filters	Sand filters - ground	Licensed operator required.
G-2	Casa Granada Apartments S.W. 87th Ave. and 141st St. Howard	.02	-	89 Units	96.4	Contact stabilization. Tertiary filters	C-100 Canal	-
G-3	El Rancho Apartments 14500 S.W. 88th Ave. Rockdale-	.02	-	89 Units	96.5	Contact stabilization. Tertiary filters	Soakage pit	-
G-4	Naval Air Station S.W. 122nd Ave. and 152nd St. Howard	.15	-	100	31.6	Conventional activated sludge	Drainfield	Licensed operator required.
H.	South Bay							
H-1	Redlands Mobile Home Park 17350 Silver Palm Drive Redlands	.015	-	80 Sites	95.2	Complete Mix	Drainfield	-
H-2	Helman Court Apartments 15401 Biscayne Drive Homestead	.025	-	128 Units	96.7	Extended Aeration	Drainfield	Licensed operator required.
H-3	Sweden House 14875 S. Dixie Highway Naranja	.02	-	520	72.2	Extended Aeration	Drainfield	-
H-4	Steak and Brew Restaurant 13190 S. Dixie Highway Goulds	.015	-	200	99.2	Extended Aeration	Drainfield	-

Table 3.--Summary of Inventory Information and Abatement Needs for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Name of Source and Address	Average Flow		Population Served	Removal Efficiency %BOD	Type of Treatment	Effluent Discharged to	Remarks
		Design	Actual					
H.	South Bay (Continued)							
H-5	Sea Glade Motel S.W. 322nd St. and U.S. 1 Florida City	.004	-	32 Units	82.7	Extended Aeration open sand filter	Soakage pit	-

Miami River Drainage Area

Nineteen minor wastewater treatment plants in the Miami River drainage area were sampled. Winn Dixie Stores, Hialeah City Hall, Hialeah Hospital, Hialeah Convalescent Home, Kings Inn, Medley Park, Saratoga Springs Apartments, Queens Inn Hotel, Seventy-ninth Street Shopping Center, and Miami Springs High School discharged waste into soakage pits or drainfields. The Holiday Inn plant discharges directly into the Miami River. Airport Lanes, Howard Johnson's, My-Am-Ee Trailer Park, and Blue Lakes Trailer Park plants discharged into Tamiami Canal. Midway Mall, Air Traffic Control Center and American Hospital Supply plants discharged into tributary canals of the Miami River or Tamiami Canal. The Country Club Garden Apartments plant discharged into a private lake.

Hialeah Convalescent Home, Kings Inn, Saratoga Springs Apartments, Queens Inn Hotel, Miami Springs High School, Hialeah City Hall, Holiday Inn, Midway Mall, Air Traffic Control Center, Blue Lakes Trailer Park, Medley Mobile Park, Seventy-ninth Street Shopping Center, American Hospital Supply, and Country Club Gardens Apartments, did not provide 90% BOD_5 and/or TSS removal.

The total daily nutrient loads discharged were 72 pounds of nitrogen compounds and 24 pounds of total phosphorus. The Howard Johnson's, Saratoga Apartments, and the Seventy-ninth Street Shopping Center plants had chlorine residuals less than 0.5 mg/l. Six plants had licensed operators and four plants were operated by licensed consultants.

Coral Gables Waterway Drainage Area

Westchester Hospital and Biltmore Hotel plants discharged directly into Coral Gables Waterway. Goldberg Apartments and Ludlam Plaza Apartments plants discharged into a soakage pit and drainfield, respectively. None of these plants met the treatment criteria for BOD_5 and TSS.

Nitrogen compounds and total phosphorus discharged were 7 and 3 lbs. per day, respectively. Goldberg Apartments, Biltmore Hotel, and Ludlam Plaza Apartments plants had chlorine residuals less than 0.5 mg/l. Westchester Hospital, Goldberg Apartments and Biltmore Hotel plant operators were not licensed.

Snapper Creek Canal Drainage Area

Jade Gardens Apartments plant discharged directly into Snapper Creek. The Kendale Lakes plant discharged into Lundgrin Road Canal, and the Florida Portland Cement, Miller Lake Apartments (Venook Apartments), Lakeview Garden Apartments and Kendall Complex plants discharged into soakage pits or drainfields.

Miller Lake Apartments, Lakeview Gardens Apartments, Kendall Complex, and Kendale Lakes plants did not provide 90% removal of BOD_5 and/or TSS.

Jade Gardens Apartments and Miller Lake Apartments plants had chlorine residuals of less than 0.5 mg/l. Kendale Lakes and Kendall Complex plants were operated by utility companies, and Miller Lake Apartments had a licensed operator.

Black Creek Drainage Area

The Casa Granada Apartments plant discharged into Canal C-100, and Camp Matecumbe, El Rancho Apartments and Naval Air Station plants discharged to the ground. The Naval Air Station plant did not provide 90% BOD_5 and/or TSS reduction.

Camp Matecumbe and Naval Air station plants had no chlorine residual. These two plants were operated by unlicensed personnel. The other plants were operated by licensed consultants.

South Bay Drainage Area

Redlands Mobile Home Park, Helman Court Apartments, Sweden House, Steak and Brew Restaurant, and Sea Glades Motel wastewater treatment plants discharged to the ground.

Sweden House, Sea Glades Motel, and Helman Court Apartments plants did not provide 90% removal of BOD_5 and/or TSS.

Thirty-five lbs per day of TSS were discharged by the Helman Courts Apartments plant. Nitrogen compounds and total phosphorus discharged were 6 and 5 lbs. per day, respectively. The Helman Court Apartments and Sweden House plants had chlorine residuals less than 0.5 mg/l. The Helman Court Apartments and Sea Glades Motel plants were operated by unlicensed personnel. The remaining plants were operated by licensed parent facilities personnel or by licensed consultants.

Operational Problems at Minor Treatment Plants

Most of the minor wastewater treatment plants in Dade County are package plants which use modifications of the activated sludge treatment process. Following is a list of their most common operational problems:

* surging - can be connected with aerated surge tanks or flow splitter boxes to level peak flows.
* inadequate methods for supernatant and sludge handling -- all digesters should have multiple level outlets.
* solids accumulation - all tanks including chlorine contact chambers and transfer sumps should be sloped to a drain or sump through which the tank can be emptied for cleaning and maintenance.
* clogged pressure filters - no submersible pump should be placed in the equalizing tanks for pressure filters. A submersible pump will force solids directly into the pressure filter, permanently clogging the media.
* clogged gravity feed chlorinators - a pump driven system is recommended to reduce clogging.
* absence or malfunction of flow measuring devices - flow meters should be installed at all plants and periodically calibrated.

It is not possible to correlate efficiency of operation with licensing of operators, because of the various types of processes and the variation of loading conditions. However, it is safe to assume that efficiency of operation would increase if personnel were trained in plant operations and were required to earn a certification.

Most package plants are not collecting adequate chemical data to insure proper operation. Data requested by the State Health Department should meet this requirement.

The 47 minor treatment plants in Dade County treat only 0.915 MGD of waste. These plants require a disproportionally high amount of labor to operate and maintain them. Therefore, it would be more economically efficient if these plants were phased out and their collection systems connected to regional treatment plants.

INDUSTRIAL WASTE SOURCES

Survey Methods

A list of over 1,800 industries was developed from manufacturers indices and city directories. Five hundred eighty three (583) liquid waste producing industries which were potential sources of industrial waste were interviewed by telephone. Information was obtained on the type and size of the industry, processes, waste treatment and disposal. Water use data were obtained from industries or water supply utilities to insure that major water users were included.

Two hundred thirty three (233) industries were visited and information was requested on the origin, type, and disposal of wastewaters; plant processes; water supply; and wastewater quality. Where applicable, FWQA Form 120, "Report of Industrial Waste Water Disposal," was completed. Also where applicable, a tour of the plant was requested and generally permitted by the industry.

No discharges were sampled during this survey, but a list of industries which should be sampled was prepared with information on sampling locations and general character of the waste. Inspection reports were prepared for 95 industries which were considered significant pollution sources. These reports are contained in Technical Appendix III, Industrial Waste Sources Inventory and Evaluation. Table 4 provides a summary of information on 89 major sources of industrial wastewater in Dade County. Water use figures reflect mean usage over a recent two to four months period.

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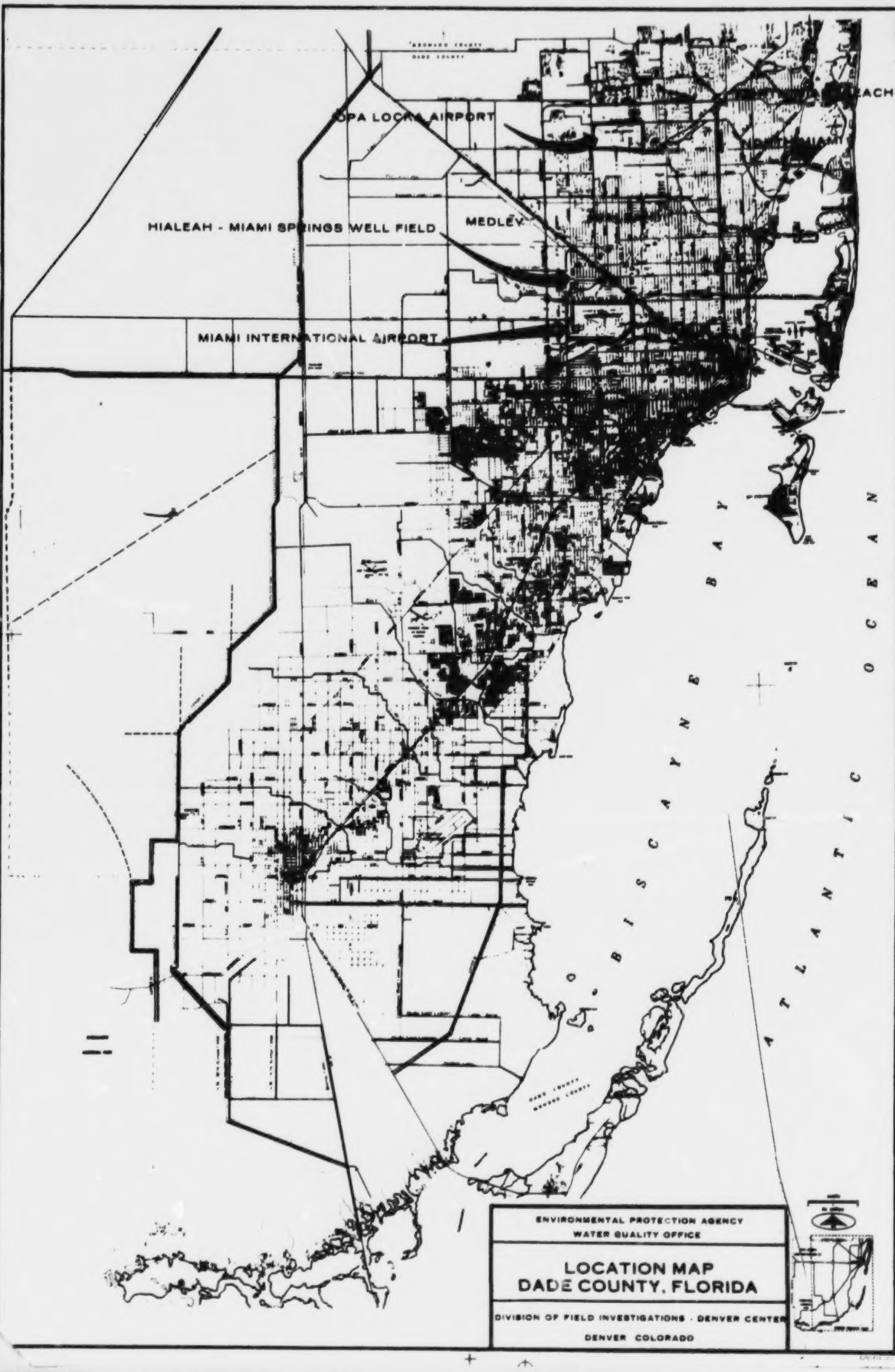
BROWARD COUNTY
DADE COUNTY
BEACH
OPA LOCKA AIRPORT
NORTH MIAMI
HIALEAH - MIAMI SPRINGS WELL FIELD
MEDLEY
MIAMI INTERNATIONAL AIRPORT
BISCAYNE BAY
ATLANTIC OCEAN
DADE COUNTY
MONROE COUNTY

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE

LOCATION MAP
DADE COUNTY, FLORIDA

DIVISION OF FIELD INVESTIGATIONS - DENVER CENTER
DENVER COLORADO

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Acme Plating and Finishing 651 West 18th Street Hialeah	Electroplating	Rinse water 1,386,000 gal/mo(4)	Heavy metals	Ground water	Minor	Pretreatment and sewer connection. Sample effluent and wells for heavy metals.
Aerodex, Inc. Miami International Airport Miami	Aircraft servicing	Wash water, sanitary 5,550,000 gal/mo(2)	Grease, oil and heavy metals, cyanide.	Canal tributary to Miami River, Sanitary sewer	Oil seperator, pH control	Adequate pretreatment and sewer connection. Sample for oil, grease, and heavy metals.
Airco Plating 3636 NW 46th Street Miami	Electroplating	Rinse water 838,000 gal/mo(4)	Heavy metals	Ground water	Neutralization, detention	Pretreatment and sewer connection. Sample well for heavy metals.
Aircraft Plating, Inc. 4101 NW 28th Street Miami	Electroplating	Wash water 3,490,000 gal/mo(3)	Heavy metals	Sanitary sewer Virginia Key	Reduction of cyanide and chromium	Data from Dade County. Company was under litigation. Recent sewer connection.
Airlift, International Miami International Airport Miami	Air freight operator	Aircraft cleaning 258,000 gal/mo(2)	Oil, solvents	Canal tributary to Miami River	Oil seperator	Pretreatment and sewer connection. Sample effluent for oil.
Airtech Services, Inc. Miami International Airport Miami	Light-aircraft overhaul	Aircraft washing 150,000 gal/mo(2)	Oil	Sanitary sewer Virginia Key	Oil seperator	None
Alert Plating 1115 NW 10th Avenue Miami	Bumper refinishing	Rinse water 1,542,000 gal/mo(3)	Heavy metals	Sanitary sewer Virginia Key	Drip tank prior to rinse	Sample effluent for heavy metals
Alton Box Board 6891 NW 74th Street Medley	Corrigated cardboard	Wash water, starch makeup	Ink, starch	recycled into starch, ground water	Settling, septic tank	Connection to sewer system.
Aluminaire, Inc. 1600 NW 165th Street North Miami Beach	Aluminum grills	Rinse water 184,000 gal/mo(6)	Aluminum	Sanitary sewer, Myrtle Grove		Sample effluent for aluminum
Aluminum Anodizing Company 3630 NW 76th Street Miami	Anodyzed aluminum	Rinse water 700,000 gal/mo(4)	Aluminum, acid, caustic, dye	Ground water	Settling	Adequate pretreatment and sewer connection. Sample effluent and wells for aluminum.

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Aluminum Finishing Corp. of Florida 13464 NW 26th Avenue Opa Locka	Anodysed aluminum	Rinse water 1,919,000 gal/mo(7)	Aluminum, acid, caustic, dye	Ground water	Settling	Adequate pretreatment and sewer connection. Sample effluent and wells for aluminum.
American Plating 50 NW 22nd Avenue Miami	Decorative plating	Rinse water 9,000 gal/mo(3)	Heavy metals	Sanitary sewer Virginia Key		Drip tank prior to rinse. Sample effluent for heavy metals.
Anodyne 1270 NW 165th Street Miami	Lithograph and silk-screen print.	Wash water dye makeup 930,000 gal/mo(6)	Dye, heavy metals	Sanitary sewer, Myrtle Creek	pH control, aeration	Sample effluent for heavy metals.
Arrow Beef Corporation 18330 NE 2nd Avenue Miami	Cut meat from carcasses	Wash water	Dried blood	Sanitary sewer Myrtle Grove	Crease trap	Pretreatment
Associated Plastics 10101 E. 31st Street Hialeah	Paints	Product makeup, washing 62,000 gal/mo(1)	Paint, solvent	Ground water		Connection to sewer system.
Atlas Metal Industries, Inc. 1135 NW 159th Drive North Miami	Fabricated metal	Rinse water	Heavy metals	Sanitary sewer Myrtle Grove		Sample water supply and effluent for heavy metals.
August Bros. Bakery Seaboard Industrial Park Miami	Bread products	Wash water	High organic load	Sanitary sewer Seaboard Ind. Park		Sample effluent for BOD
Beverage Canners Seaboard Industrial Park Miami	Canned soft drinks	Product makeup, wash water 3,320,000 gal/mo(3)	Organic loading	Sanitary sewer, Seaboard Ind. Park		Sample effluent for BOD
Birmy Photo Engraving Co. 2244 NW 21st Terrace Miami	Photo developing printing, and engraving	Rinse water	Photo chemicals ferric chloride	Sanitary sewer Virginia Key		None

Table 4.--Significant Industrial Wastewater Sources in Dade County, Flordia--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Borden's Dairy 7103 NE 2nd Avenue Miami	Milk and dairy products	Waste water	Organic loading	Ground water		Connection to sewer system.
Britt Metal Processing, Inc. 7490 NW 24th Avenue Miami	Aircraft engine parts	Chrome plating solution, washing 46,000 gal/mo(3)	Chromium	Ground water	Chromium reduction precipitation	Connection to sewer system.
Butler Aviation of Miami, Inc. Miami International Airport Miami	Refurbishing of used aircraft	Aircraft stripping and cleaning 182,000 gal/mo(2)	Oil, caustic, acid, solvents heavy metals	Canal tributary to Miami River	Settling tank	Pretreatment and connection to sewer system
Canada Dry Bottling Co. of Florida, Inc. 5900 NW 72nd Avenue Miami	Soft drinks	Water treatment, product makeup wash water	Organic loading	58th St. Canal	Being installed	Company presently under litigation
Capital Film Labs, Inc. 1998 NE 150th Street North Miami	Movie film processing	Rinse water 920,000 gal/mo(5)	Photo chemicals	Sanitary sewer, North Miami	Silver precipitation, solution recycling	None
Coca Cola Bottling Company of Miami 301 NW 29th Street Miami	Soft drinks	Product makeup, washing 4,511,000 gal/mo(3)	Organic loading	Sanitary sewers, Virginia Key		None
Colebrook Knitting Mills 3965 E. 10th Ct. Hialeah	Knit sweaters	Sweater washing	Natural oils	Closed system	recycling	None
Colorgraphic Photo Engravers 1822 NW 22nd Street Miami	Photo engraving	Rinse water 3,300 gal/mo(1)	Photo chemicals	Sanitary sewers Virginia Key		None
Continental Bumper Plating 4975 E. 10th Lane Hialeah	Bumper refinishing	Rinse water 6,100 gal/mo(4)	Cyanide, heavy metals	Ground water	Settling	Pretreatment and connection to sewer system. Sample effluent

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Continental Can Company Seaboard Industrial Park Miami	Cans	Cooling 314,000 gal/mo(3)	Heat, heavy metals	Sanitary sewer, Seaboard Ind. Park		Sample effluent.
Cott Bottling of Florida 7130 NW 35th Avenue Miami	Soft drinks	Product makeup, washing	Organic loading	Ground water		Connection to sanitary sewer system.
Dade County Dairies 7350 NW 30th Avenue Miami	Milk products	Wash water, cooling	Bacteria, organics	Ground water	Spray irrigation	Connection to sewer system.
Dade Division, American Hospital Supply Corporation 1851 Delaware Parkway Miami	Diagnostic Reagents	Wash water 181,000 gal/mo(1)	Chemicals, bacteria	Sanitary sewer Virginia Key	pH control	Sample effluent
Delta Air Lines Miami International Airport Miami	Airline	Aircraft washing	Oil, solvents	Canal	Oil seperator	Now minor use of facility. Company under litigation.
Diamond Color Labs 1999 NE 150th Street North Miami	Film processing	Rinse water	Photo chemicals	Sanitary sewer North Miami		Inspector refused admission to plant. Sample effluent. Company reportedly treats effluent.
Dodge, Inc. 380 NE 60th Street Miami	Electroplating	Rinse water 29,000 gal/mo(3)	Heavy metals	Ground water	Settling	Pretreatment and connection to sewer system.
Eastern Air Lines Miami International Airport Miami	Airline	Aircraft washing, metal plating 14,520,000 gal/mo(2)	Oil, heavy	Sanitary sewer, Virginia Key Canal	Oil seperator, metal precipitation	Connection of all wastes lines to sewer system
Economy Packing Company 2419 West 3rd Court Hialeah	Killing and cutting beef	Washing 498,000 gal/mo(4)	Grease, organic loading	Ground water	Grease traps septic tanks	Connection to sewer system
Engravers, Inc. 1120 NW 21st Street Miami	Photo engraving	Rinse water	Photo chemicals, heavy metals	Sanitary sewer, Virginia Key	Neutralization, silver precipitation	Classified work, no plant admittance.

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Estes Silversmiths 2152 NW 17th Avenue Miami	Decorative plating	Rinse water	Heavy metals	Sanitary sewer, Virginia Key		Small operation.
Far Mac Plating, Inc. 2196 NW 17th Avenue Miami	Metal plating	Rinse water 12,000 gal/mo(1)	Heavy metals	Sanitary sewer, Virginia Key		Sample effluent for heavy metals
Farm Stores, Inc. 5800 NW 74th Avenue Miami	Milk and Ice cream	Process, cooling, boiler from well	Waste milk and products	Ground water	Activated treatment	Better operation at existing waste treatment facilities.
Federal Packing Company 330 W. 23rd Street Hialeah	Killing and cutting beef	Washing 599,000 gal/mo(4)	Blood, paunch manure, grease	Ground water	Ineffective old package plant	Pretreatment. Connect to sewer system when completed in Hialeah area.
Florida Carib Fishery, Inc. 25 SW South River Drive Miami	Lobster Processer		Organic loading from lobster process	Sanitary sewer Virginia Key	None	Pretreatment
Florida Live-Pack Lobster Sales 34 Hook Square Miami Springs	Lobster sales	Cooling water	Coliforms	Canals	Settling	Connection to sewer system. Fecal coliforms apparently result from other tenants (theatre) on property. Company under litigation.
Florida Processing Company 6900 NW 69th Street Miami Springs	Tallow and meat scrap processing	Rinse water boiler feed	Organic loading grease	Trucked to Virginia Key	Package plant chlorination	In operation.
G. Gertz Enterprises 3401 NW 73rd Street Miami	Knitting mill	Washing and dyeing 682,000 gal/mo(4)	Oil and dye	Ground water	Carbon filters	Connection to sewer system.
Gotham Provision Company, Inc. 7301 NW 74th Street Medley	Killing and cutting beef	Washing	Blood, pauch manure, grease	Ground water	Settling, grease trap	Connection to sewer system
Henderson's Portion Pak 4202 Salzedo Coral Gables	Processing food products	Wash water shrimp thawing	Grease, organic loading	Sanitary sewer Coral Gables	Grease trap	None

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Table 4.—Significant Industrial Wastewater Sources in Dade County, Florida—Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Home Milk Producers Association 2451 NW 7th Avenue Miami	Process milk	Wash, cooling 7,266,000 gal/mo(3)	Organic loading	Sanitary Sewer Virginia Key	Recirculated cooling water	None
Homestead Air Force Base Homestead	Air Force Base	Washing aircraft	Solvents, detergent, oil and grease	Canals	Oil seperator	None
Howard Johnson 1631 West Flagler Street Miami	Ice cream	Boiler feed, cooling, process wash water 240,000 gal/mo(3)	Organic loading	Sanitary sewer Virginia Key		None
International Aerodyne, Inc. Miami International Airport Miami	Aircraft maintenance	Aircraft washing and stripping 8,300 gal/mo(2)	Oil, caustic, acid, solvent, heavy metals	Sanitary sewer Virginia Key	None	Pretreatment: Sample drain durin aircraft washing. Question as to disposal of waste.
Jim Robbins Seat Belt Company 705 E. 10th Avenue Hialeah	Finish seat belts from spool fabric	Cooling, washing 3,300,000 gal/mo(4)	Dye	Sanitary sewer for cooling water. Sealed pit for dye wash	None	None
Key Biscayne Hand Print 3480 NW 41st Street Miami	Silk screen printing	Water feed, washing and dyeing	Dye	Hauled away	None	Connect to sewer.
Kim Color (Tremendous Color, Monkey Color, Inc.) 532 West 20th Street, Hialeah	Photo processing	Rinse water 2,196,000 gal/mo(4)	Photo chemicals	Ground water	Settling	Pretreatment and connection to sewer system (Plans have been made for connection)
London Platers 1080 E. 24th Street Hialeah	Decorative plating	Rinse water from well	Heavy metals	Ground water		Pretreatment and connection to sewer system. Sample effluent and wells for heavy metals
McArthur Jersey Farms 6851 NE 2nd Avenue Miami	Milk distribution	Cooling, washing 6,592,000 gal/mo(3)	Organic loading	Ground water		Connection to sewer system

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Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Miami Aviation Corporation Opa Locka Airport Opa Locka	Aircraft refurbishing	Aircraft stripping and cleaning 280,000 gal/mo(2)	Oil, solvents acid, caustic, heavy metals	Canal via storm drain	None	Pretreatment and connection to existing sanitary sewer system. Sample drainage, trace flow with dye.
Miami Board, Division of Simkins Ind., Inc. P. O. Box 1397 Miami	Cardboard	Cooling, wash, process	Organic loading, settleable solids	Tamaimi Canal	Clarification, chlorination	Connection to sewer system. Company under litigation
Miami Dye Works 355 NE 72nd Terrace Miami	Dyed fabrics	Wash water 650,000 gal/mo(3)	Dye, organics	Ground water (salt water)	Settling	Pretreatment and connection to sewer system
Milgo Electronic Corporation 7620 NW 36th Avenue Miami	Electronic equipment manufacture	Rinse water from chrome plating 374,000 gal/mo(4)	Chromium	Ground water	Chromium reduction, settling	Connection to sewer system. Sample effluent for chromium
Miller Industries 16295 NW 13th Avenue Miami	Aluminum pieces	Rinse water 325,000 gal/mo(6)	Haxavalent chromium	Sanitary sewer Myrtle Grove	None	Pretreatment for chromium reduction
Modern Air Transport Miami International Airport Miami	Air freight	Aircraft washing 692,000 gal/mo(2)	Oil, solvents, heavy metals	Canal tributary to Miami River	Primitive oil seperator	Pretreatment and connection to sewer system.
Modern Aluminum Coatings, Inc. 7295 NW 64th Street Miami	Anodyzed aluminum	Rinse water from wells	Aluminum, acid, caustic	Ground water	Settling	Pretreatment and connection to sewer system. Sample inflow and outflow from pond for aluminum.
National Brewing Company 637 NW 13th Street Miami	Fermented drinks	Wash water, product makeup, 16,529,000 gal/mo(3)	Organic loading	Sanitary sewer Virginia Key		None
National Linen Service 1950 NW 1st Avenue Miami	Commercial linen cleaning	Wash water 5,600,000 gal/mo(1)	Soap, oil	Sanitary sewer Virginia Key	Soap degradation	None

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Natro, Inc. (Veric Processing) 2755 W. 8th Avenue Hialeah	Textiles	Unknown	Dye, paint	Ground water	Have plant	Refused to see inspectors. Effluent from plant visibly discolored. Sample.
Neway Laundry 160 Ali Baba Avenue Opa Locka	Commercial laundry	Wash water 1,942,000 gal/mo(7)	Soap, caustic	Sanitary sewer, Opa Locka	Settling	None
Northeast Air Lines Miami International Airport Miami	Passenger and freight airline	Aircraft washing 35,000 gal/mo(2)	Oil, solvents, heavy metals	Canal tributary to Miami River	3 primitive oil seperators	Pretreatment and connection to sewer system.
Pepsi Cola Bottling Company of Miami, Inc. 7777 NW 41st Street Miami	Soft drink manufacture	Process boiler feed domestic use from wells	Unknown constitutants being sampled by Dade County Pollutant Control	Graham Dairy Canal	Have plant	Reddish-brown effluent flow from existing plant. Need to improve and properly operate plant.
Perkins Marine Lamp and Hardware Corporation 16490 NW 13th Avenue Miami	Manufacture marine hardware	Process, boiler feed, domestic use 1,379,000 gal/mo(6)	Heavy metals	Sewer	None	Pretreatment
Propeller Service of Miami and Aero Facilities, Division of Prop. Service Miami International Airport Miami	Aircraft maintenance	Washing 250,000 gal/mo(2)	Oil and grease, solvent cleaner	Sewer, Canal tributary to Miami River	2 oil seperators retention tank hauling service	Verify by sampling that system sewer are adequate pretreatment Connection to sewer system.
Robert Russell Metals 5761 NW 37th Avenue Miami	Produces aluminum extrusion billets	Cooling wells	Metals	Ground water	Settling	Pretreatment and connection to sewer.
Seaboard Coastline Railroad Miami	Freight transport	Washing of rail equipment	Oil, solvents	Canal	Flotation, floculation	Connection to sewer system
Salig Chemical 660 W. 18th Street Hialeah	Warehousing chemical	Washing	Unknown	Ground water	Settling	Pretreatment and connection to sewer.

Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Tripure Spring Water Company and Standard Chemical Co. 3355 NW 73rd Street Miami	Bottled water	Wash water, product makeup, boiler feed 506,000 gal/mo(1)	Minerals, detergents	Ground water	None	None
Tropical Plating 1825 NW 79th Street Miami	Decorative metal plating	River water-wells	Heavy metals cyanide	Ground water	Settling	Pretreatment and connection to sewer. Sample effluent for heav metals.
Uni-Vinyl Corporation 3750 NW 43rd Street Miami	PVC compounding	Cooling	PVC and other organics	Ground water	None	Connection to sewer
Zippy Chocolate Beverage 355 NW 52nd Street Miami	Chocolate beverages	Product makeup boiler feed, wash	Organic loading, detergent BOD 800-1,000 mg/l	Ground water	None	Connection to sewer system

Source of Water-Use Data.

1/ Supplied by Company..
2/ Dade County Port Authority.
3/ Miami Water Department.
4/ Hialeah Water Department.
5/ North Miami Water Department.
6/ North Miami Beach Water Department
7/ Opa Locka Water Department.

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Table 4.--Significant Industrial Wastewater Sources in Dade County, Florida--Continued

Industry	Major Product or Service	Water Use Type and Amount	Nature of Waste Discharged	Receiving Water	Present Treatment	Treatment Needs - Remarks
Smith and Butterfield 3170 NW 36th Street Miami	Film developer	Rinse water 190,000 gal/mo(1)	Photo chemicals	Ground water	Silver precipitation	Connection to sewer
Smith, Richardson, and Conroy 3500 NW 62nd Street Miami	Portion pack meat	Boiler feed wash water 250,000 gal/mo(1)	Oil and grease Organic loading	Ground water	Settling, oil and grease skimming	Connection to sewer
Southern Air Transport, Inc. Miami International Airport Miami	Air transport freight	Washing aircraft and equipment 50,000 gal/mo(2)	Oil, grease and solvents	Sanitary sewer Virginia Key	Oil skimmer	None
Southern Plating, Inc. 720 NW 72nd Street Miami	Plated aircraft parts	Rinse water 156,000 gal/mo(3)	Cyanide and heavy metals	Sanitary sewer Virginia Key	None	Pretreatment
Southern Beverages 3601 NW 55th Street Miami	Soft drink manufacture	Process product makeup, rinsing	Organics and detergent	Ground water	None	Connection to sewer
Standard Bumper Corporation 2500 W. 3rd Ct., Hialeah	Bumper refurbishing	Rinse water 22,000 gal/mo(4)	Heavy metals, cyanide	Ground water	None	Pretreatment and connection to sewer. Sample effluent for heavy metals.
Super Brand Dairy Seaboard Industrial Park Miami	Milk distribution	Wash water 1,070,000 gal/mo(3)	Organic loading at 860 ppm BOD	Sanitary sewer Seaboard Ind. Park	None	Pretreatment
Sun-Aid Food Products 3615 NW 60th Street Miami	Manufacture jelly, jams, mustard mayonnaise	Product makeup cooling wash 240,000 gal/mo(1)	Organic loading	Ground water	Grease trap	Connection to sewer system
Tallo-Master Scott Road Medley	Grease processing	Wash, cooling	Grease	Canal	Oxidation pond, skimming	Connection to sewer system. Company cited by county for grease discharges.
Tower Paint Company 620 West 27th Street Hialeah	Manufacture paint	Product makeup wash 77,000 gal/mo(4)	Paint, solvents, detergents	Ground water	Settling and sludge disposal	Pretreatment and connection to sewer

Receiving Waters

Of 89 industries having significant wastewater discharges, 15 discharged into surface water courses, 36 discharged to ground water through seepage pits, and 38 discharged into sanitary sewer systems.

Five plants which discharged to surface waters would be expected to have biodegradable organic wastes. All have some treatment.

Canada Dry - treatment being installed

Florida Live Pack Lobsters - settling

Miami Board - clarifier and chlorination

Pepsi Cola - treatment plant

Tallowmaster - oxidation pond

The 10 remaining surface-discharge plants had wastes such as oil and grease, solvent, detergents, and sludge. Eight are located at the Miami International Airport.

Aerodex

Airlift International

Butler Aviation

Delta Airlines

Eastern Airlines

Miami Aviation

Modern Air Transport

Northwest Airlines

These airport area industries discharged wastes into the canal system within the Miami International Airport tributary to Miami River. Canals are in the Miami Springs-Hialeah well field, a major municipal water supply source for the Miami Metropolitan area.

Homestead Air Force Base and Seaboard Coastline discharged their wastes into canals in their respective drainage basins.

Thirty-six (36) industries discharged untreated (or partially treated) waste to ground water "three dry wells" or seepage pits. This practice is especially common in the Hialeah area immediately adjacent to the Miami Springs-Hialeah well field, and may cause contamination of the groundwater aquifer.

Thirty-eight (38) major industries discharged both process and sanitary wastes into municipal sewer systems. The wastes may be of major concern to the sewage treatment plant operators. Operational difficulties have occurred at the Myrtle Grove and Miami Lakes Utilities plants because of the high proportion of industrial waste.

Sewage system operators are protected from indiscriminate industrial waste discharges by a ruling of the Dade County Board of County Commissioners known as Rule 7--"Regulations of the Use of Sanitary and Storm Sewers and the Discharge of Waters and Wastes into Utilities' Sewerage Systems." Under this rule, utility companies require disclosure through sampling and analysis of the pollution load of certain proposed or existing industrial discharge and may require pretreatment at the industries expense where necessary. A copy of Rule 7 is included in Appendix A-11.

Waste Characteristics

Group I - Food Processing and Paper:

Dairy wastes are high in dissolved organic substances, contain lactic acid and casein and about 1000 mg/l of BOD. Surprisingly, dairy wastes are reported to contain mercury in the range of 25-75 mg/1.[1/]

Bakery wastes result from discarding and washings and contain sugars and yeasts which exert extremely high BOD.

Meat packing and processing, and rendering plants contain meat scraps, blood, washings, fats and suspended solids arising from trimming, cleaning, and dressing of animals. The BOD_5 levels may be as high as 32,000 mg/1 for blood washings while for other processes such as lard rendering BOD_5 may be up to 200 mg/1.

Beverage and bottling operations have variable waste characteristics resulting from alkaline bottling operations, leftover drinks, and syrup spills.

Paper board processing wastes contain suspended solids, settleable solids, andBOD. Past analyses of the Miami Board plant indicated an effluent fecal coliform level of 10^6 per 100 ml.

Group II - Aircraft Engine Repair and Painting:

Wastes from aircraft repair, washing and painting contain detergents, oils and grease, residual metals, cyanides and miscellaneous organic material.

Group III - Chemical and Film Processing wastes:

Photographic wastes consist of spent reducing solutions (hydroquinone and pyrogallol) and fixing solutions (sodium thiosulfate). These solutions exert both chlorine and oxygen demand. In the photographic

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[1/] Nemerow, Leonard Nelson, Theories and Practices of Industrial Waste Treatment, Addison-Wesley Publishing Co., Inc., Reading, Mass., 1963, p. 326.

process, other chemicals may be used: ferricyanide as a color bleaching agent, benzyl alochol in color developing, and chromium in slide processing. Proprietary developing and fixing solutions might also enter into the process.

Mercury is reported to be a reagent used at the Dade Division of American Hospital.

Group IV - Metal Plating Industries:

Metal plating wastes may be acidic or alkaline depending upon the plating process or the stage from which the waste is removed. Acidic wastes usually contain sulfuric, hydrochloric, nitric, acetic and/or phosphoric acids. Alkaline wastes may contain sulfide, cyanide and hydroxide anions, detergents, soaps, oils and suspended solids.

Heavy metals such as nickel, chromium, zinc, cadmium, copper, iron, and mercury might enter the waste stream as part of the process or as a contaminant of another metal introduced into the process.

Abatement Actions

Fourteen industries are presently involved in litigation under various Federal and local ordinances (Table 5). Three oil discharge actions are being prosecuted under the 1899 Refuse Act and three are being prosecuted under county regulations. Other industrial cases carried under county ordinance include Canada Dry Bottling Co., Pepsi Cola Bottling Co., Farm Stores, Inc., Florida Live Pack Lobster Sales, Miami Board, Florida Processing, Tallowmaster and Natro, Inc.

Table 5.--Industries Currently Under Enforcement Action

Company	Pollution Problem	Type Action	Status
Aerodex, Inc.	Oil Discharge	1899 Act	Company reducing activities.
Airlift, International	Oil Discharge	1899 Act	Company reinstituted use of oil seperator.
Modern Air Transport	Oil Discharge	1899 Act	Discharges continuing.
Canada Dry Bottling Co.	Process waste to Canal	County Regulation	Continuing. Plant being installed.
Delta Air Lines	Oil Discharge	County Regulation	Activities reduced.
Farm Stores, Inc.	Milk wastes	County Regulation	Existing treatment plant not operating properly.
Florida Live-Pack Lobster Sales	Fecal coliform	County Regulation	Apparently results from cross connection by tenant. Investigation continuing.
Florida Processing	Grease	County Regulation	Now hauling waste to plant, prior to completion of new treatment system.
National Air Lines	Oil Discharge	County Regulation	New plant recently completed.
Pan American Air Lines	Oil Discharge	County Regulation	Recently improved treatment.
Pepsi-Cola Bottling Co.	Process waste	County Regulation	Discharge continuing.
Miami Board, Simkins Industries	Fecal coliform	County Regulation	Apparently results from cross connection. Investigation continuing.
Tallo-Master	Grease discharge	County Regulation	Skimmer not maintained.
Natro, Inc. (Veric Processing)	Paint and dye in effluent	County Regulation	Discharge continuing.

Information furnished by Dade County Pollution Control.

Additional Sampling and Evaluation

Additional industrial waste sampling and analysis at 43 plants was initiated on May 17, 1971. Included in this survey are:

GROUP I - FOOD PROCESSING

Bordens Dairy

Canada Dry

Cott Bottling

Dade Co. Dairies

Economy Packing

Farm Stores

Federal Packing Co.

Florida Live Pack Lobster

Florida Processing Co.

Gotham Provision Co.

MacArthur Jersey Farm

Miami Board

Pepsi-Cola

Tallowmaster

GROUP II - AIRCRAFT REPAIR AND PAINTING

Aerodex

Airlift International

Butler Aviation of Miami

Delta Air Lines

Eastern Air Lines

Homestead Air Force Base

Miami Aviation Corp.

Modern Air Transport
Northeast Airlines
Propeller Service of Miami
Seaboard Coastline Railroad

GROUP III - CHEMICAL AND FILM PROCESSING

Dade Division, American Hospital Supply
Gertz
Kim Color
Miami Dye Works
Natro
Smith and Butterfield

GROUP IV - METAL PLATING

Acme Plating and Finishing
Airco Plating
Aluminum Anodizing Co.
Aluminum Finishing Corp. of Florida
Continental Bumper Plating
London Platers
Milgo Electric Corp.
Modern Aluminum Coatings
Standard Bumper
Tropical Plating

GROUP V - PAINT COMPANIES

Associated Plastics
Tower Paint Co.

Table A-1.--Average Efficiencies and Effluent Loads for Major Municipal Waste Sources, Dade County, Florida
Biochemical Oxygen Demand and Total Suspended Solids

Facility	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent	Percent removal	Load lb/day
Snake Creek Drainage									
Andover	1.714	164	20	84.0	309	135	17	83.0	200
Carol City	2.030	164	31	82.5	520	146	56	71.2	96
Riverdale Estates	0.362	456	66	85.6	190	369	249	32.6	769
Golden Isles	0.642	182	32	82.4	172	182	31	79.9	166
Myrtle Grove-City of North Miami	1.645	250	21	91.8	289	394	24	93.8	330
Country Club of Miami	0.185	138	4	94.5	6	102	13	85.0	20
Palm Springs North S.D.	0.447	265	18	92.8	67	922	9	98.6	34
Biscayne Canal and Little River Canal Drainage									
Miami Lakes Utilites	0.727	233	42	79.8	253	172	72	70.9	316
Seaboard Industrial Park	0.117	788	32	95.0	31	866	27	95.2	26
Opa Locka Airport-Dade County Port Authority	0.183	187	34	82	60	129	16	87	24
Miami River Drainage									
Atomic Sewerage	0.024	1,126	106	89.9	22	1,348	124	89.0	27
Doral Country Club	0.215	295	28	90.1	53	218	54	57.6	108
Coral Gables Waterway									
Lil' Abner Trailer Park	0.072	402	52	84.1	32	350	80	79.1	52
Pan American Hospital	0.036	209	5	97.8	2	248	65	60.1	20
Community Utilities	2.471	211	12	94.4	230	200	24	87.5	499
Snapper Creek Drainage									
Peninsular Utilites	2.500	230	24	89.5	502	365	41	88.9	847
Southern Estates	1.428	134	31	76.1	373	166	50	69.7	588
Westwood Lakes	1.970	227	57	74.0	939	798	52	94.3	856

Table A-1.--Average Efficiencies and Effluent Loads for Major Municipal Waste Sources, Dade County, Florida
Biochemical Oxygen Demand and Total Suspended Solids --Continued

Facility	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent	Percent removal	Load lb/day
Black Creek Drainage									
South Miami Heights	1.089	507	34	92.2	306	958	83	85.1	751
Cutler Ridge	2.195	209	21	86.5	479	374	78	73.8	1,473
Bell Aire S.D.[1]	0.423	233	51	77.8	180	285	28	89.5	99
South Bay Drainage									
Homestead Air Force Base	2.116	52	18	63.7	318	69	38	76.0	631
City of Homestead	0.893	174	31	82.7	222	258	42	84.7	306
South Dade Labor Camp	0.126	500	33	93.9	35	785	10	98.7	11
Redland Labor Camp[2]	0.057	479	18	90.6	23	679	34	90.6	43
Leisure City[2]	0.296	238	31	86.8	76	437	73	81.2	175
Atlantic Ocean									
Virginia Key-City of Miami	40.3	311	64	79.3	21,640	654	75	88.4	2,445
North Miami	13.5	64	-	-	722	115	-	-	12,978
Sunny Isles	1.5	144	-	-	1,804	91	-	-	1,140
Miami Beach	21.8	165	-	-	29,998	176	-	-	31,998

[1] Contributes 40 percent of load surface water, 60 percent to ground water.
[2] Ground water discharge.

Table A-2.--Average Efficiencies and Effluent Load for Major Municipal Waste Sources, Dade County, Florida--Continued
Chemical Oxygen Demand and Total Organic Load

Facility	Flow MGD	Chemical Oxygen Demand				Total Organic Carbon			
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent	Percent removal	Load lb/day
Snapper Creek Drainage									
Peninsular Utilities	2.500	679	79	86.9	1,656	142	20	85.3	406
Southern Estates	1.428	501	106	78.0	1,253	96	31	67.6	362
Westwood Lakes	1.970	556	164	70.5	2,701	128	58	52.4	955
Black Creek Drainage									
South Miami Heights	1.089	2,051	95	95.0	854	264	11	84.4	272
Cutler Ridge	2.195	714	66	90.5	1,219	116	29	73.0	533
Bell-Aire S.D.[1/]	0.423	605	151	71.9	534	126	39	69.0	137
South Bay Drainage									
Homestead Air Force Base	2.116	446	60	84.1	1,045	44	18	56.7	309
City of Homestead	0.893	368	99	73.5	714	106	43	56.8	304
South Dake Labor Camp	0.126	3,069	227	92.9	239	335	18	94.6	19
Redlands Labor Camp[2/]	0.057	1,016	63	89.5	79	234	17	84.2	22
Leisure City[2/]	0.296	785	93	87.1	233	163	32	80.8	80
Atlantic Ocean									
Virginia Keys-City of Miami	40.3	791	172	77.9	57,580	239	50	78.4	16,720
North Miami	13.5	540	-	-	60,938	42	-	-	4,740
Sunny Isles	1.5	560	-	-	7,018	97	-	-	1,216
Miami Beach	21.8	522	-	-	94,905	70	-	-	12,726

[1/] Contributes 40 percent to surface water, 60 percent to ground water

[2/] Ground water discharge.

Table A-3.--Average Efficiencies and Effluent Load for Major Municipal Waste Sources, Dade County, Florida--Volatile Suspended Solids and Settleable Solids

Facility	Flow MGD	Volatile Suspended Solids				Settleable Solids	
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent
Snake Creek Drainage							
Andover	1.714	119	12	70.0	209	9	0.1
Carol City	2.030	106	42	63.7	713	11	0.2
Riverdale Estates	0.362	425	162	60.0	468	27	4.0
Golden Isles	0.642	157	28	79.4	150	10	1.0
Myrtle Grove-City of North Miami	1.645	334	21	93.6	289	8.5	.1
Country Club of Miami	0.185	84	11	83.3	17	7	0.1
Palm Springs North S.D.	0.447	870	6	99.3	22	35	.1
Biscayne Canal and Little River Canal Drainage							
Miami Lakes Utilities	0.727	132	29	77.2	175	8	1.2
Seaboard Industrial Park	0.117	783	21	96.0	21	18	.1
Opa Locka Airport-Dade County Port Authority	0.183	99	12	88	18	4	.3
Miami River Drainage							
Atomic Sewerage	0.024	1,235	73	92.5	15	32	0.08
Doral Country Club	0.215	122	46	26.0	86	12	0.34
Coral Gables Waterway							
Lil' Abner Trailer Park	0.072	212	32	80.2	25	14	0.8
Pan American Hospital	0.036	134	29	53.8	8.7	15	0.1
Community Utilities	2.471	170	21	87.4	420	19	0.1
Snapper Creek Drainage							
Peninsular Utilities	2.500	344	34	90.6	701	7.5	0.1
Southern Estates	1.428	138	40	70.8	472	5	0.1
Westwood Lakes	1.970	743	47	93.7	774	13	0.3

Table A-3.--Average Efficiencies and Effluent Load for Major Municipal Waste Sources, Dade County, Florida--Volatile Suspended Solids and Settleable Solids--Continued

Facility	Flow MGD	Volatile Suspended Solids				Settleable Solids	
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent
Black Creek Drainage							
South Miami Heights	1.089	923	75	85.0	668	19	0.1
Cutler Ridge	2.195	342	69	73.6	1,293	7	0.1
Bell Aire S.D.1/	0.423	250	23	94.6	81	9	0.1
South Bay Drainage							
Homestead Air Force Base	2.116	65	8.3	86.0	149	3	0.2
City of Homestead	0.893	181	34	82.3	248	8	0.1
South Dade Labor Camp	0.126	731	6	99.2	6	2	0.1
Redlands Labor Camp2/	0.057	652	28	91.9	35	9	0.5
Leisure City2/	0.296	413	71	81.7	169	9	0.2
Atlantic Ocean							
Virginia Key-City of Miami	40.3	580	61	89.8	19,100	10	0.1
North Miami	13.5	96	-	-	10,833	1.5	-
Sunny Isles	1.5	79	-	-	990	2	-
Miami Beach	21.8	130	-	-	23,635	8	-

1/ Contributes 40 percent to surface water, 60 percent to ground water.
2/ Ground water discharge.

Table A-3.--Average Efficiencies and Effluent Load for Major Municipal Waste Sources, Dade County, Florida--Volatile Suspended Solids and Settleable Solids

Facility	Flow MGD	Volatile Suspended Solids				Settleable Solids	
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent
Snake Creek Drainage							
Andover	1.714	119	12	70.0	209	9	0.1
Carol City	2.030	106	42	63.7	713	11	0.2
Riverdale Estates	0.362	425	162	60.0	468	27	4.0
Golden Isles	0.642	157	28	79.4	150	10	1.0
Myrtle Grove-City of North Miami	1.645	334	21	93.6	289	8.5	.1
Country Club of Miami	0.185	84	11	83.3	17	7	0.1
Palm Springs North S.D.	0.447	870	6	99.3	22	35	.1
Biscayne Canal and Little River Canal Drainage							
Miami Lakes Utilities	0.727	132	29	77.2	175	8	1.2
Seaboard Industrial Park	0.117	783	21	96.0	21	18	.1
Opa Locka Airport-Dade County Port Authority	0.183	99	12	88	18	4	.3
Miami River Drainage							
Atomic Sewerage	0.024	1,235	73	92.5	15	32	0.08
Doral Country Club	0.215	122	46	26.0	86	12	0.34
Coral Gables Waterway							
Lil' Abner Trailer Park	0.072	212	32	80.2	25	14	0.8
Pan American Hospital	0.036	134	29	53.8	8.7	15	0.1
Community Utilities	2.471	170	21	87.4	420	19	0.1
Snapper Creek Drainage							
Peninsular Utilities	2.500	344	34	90.6	701	7.5	0.1
Southern Estates	1.428	138	40	70.8	472	5	0.1
Westwood Lakes	1.970	743	47	93.7	774	13	0.3

Table A-4.--Average Concentrations and Effluent Load for Major Municipal Waste Sources for Dade County, Florida
Nitrogen, Phosphorus and Chlorides

Facility	Flow MGD	Kjeldahl Nitrogen as N Effluent mg/l	Kjeldahl Nitrogen as N Load lb/day	Ammonia Nitrogen as N Effluent mg/l	Ammonia Nitrogen as N Load lb/day	Organic Nitrogen as N Effluent mg/l	Organic Nitrogen as N Load lb/day	NO_2+NO_3 as N Effluent mg/l	NO_2+NO_3 as N Load lb/day	Total Phosphorus as P Effluent mg/l	Total Phosphorus as P Load lb/day	Chloride mg/l
Snake Creek Drainage												
Andover	1.714	5.6	79	3.8	53	1.8	26	10.0	140	7.6	107	67
Carol City	2.030	21.8	368	17.4	296	4.3	73	2.2	37	9.0	154	36
Riverside Estates	0.362	11.0	31	1.9	6	9.0	25	16.0	46	16.4	50	43
Golden Isles	0.642	24.0	129	21.4	115	2.6	14	0.08	0.4	11.1	60	114
Myrtle Grove-City of North Miami	1.645	25.6	352	23.3	320	2.3	32	0.01	0.1	10.8	149	69
Country Club of Miami	0.185	1.8	2.8	0.5	0.8	1.3	2	1.3	2.0	6.8	11	30
Palm Springs North S.D.	0.447	26.3	98	25	93	1.3	4	0.5	2.0	13.7	31	68
Biscayne Canal and Little River Canal Drainage												
Miami Lakes Utilities	0.727	18.0	109	13.9	84	4.1	25	1.7	10.0	13.0	80	75
Seaboard Industrial Park	0.117	3.1	3	4.7	5	3.7	4	0.05	0.05	6.6	7	62
Opa Locka Airport-Dade County Port Authority	0.183	4.8	7.3	1.88	2.9	N.D.	N.D.	25.0	38.2	9.2	14.1	192
Miami River Drainage												
Atomic Severage	0.024	19.0	4	8.0	2	11.0	2	0.3	0.1	7.5	2	116
Doral Country Club	0.215	10.8	19	5.0	9	5.8	10	1.3	3	6.7	13	55
Coral Gables Waterway												
Lil' Abner Trailer Park	0.072	26.7	16	19.5	12	7.2	4	0.6	0.1	15.2	9	79
Pan American Hospital	0.036	1.9	0.6	0.7	0.2	1.2	0.4	12.4	4	2.1	0.6	118
Community Utilities	2.471	15.3	315	14.5	300	0.8	16	4.4	90	7.2	149	46
Snapper Creek Drainage												
Peninsular Utilities	2.500	20.5	427	19.4	405	1.3	27	0.02	0.1	9.4	195	36
Southern Estates	1.428	13.5	161	11.4	135	2.2	26	0.9	10	8.7	104	45
Westwood Lakes	1.970	25.1	413	19.2	316	5.9	97	0.26	4	11.8	194	57

Table A-3.--Average Efficiencies and Effluent Load for Major Municipal Waste Sources, Dade County, Florida--Volatile Suspended Solids and Settleable Solids--Continued

Facility	Flow MGD	Volatile Suspended Solids				Settleable Solids	
		Influent	Effluent	Percent removal	Load lb/day	Influent	Effluent
Black Creek Drainage							
South Miami Heights	1.089	923	75	85.0	668	19	0.1
Cutler Ridge	2.195	342	69	73.6	1,293	7	0.1
Bell Aire S.D.[1]	0.423	250	23	94.6	81	9	0.1
South Bay Drainage							
Homestead Air Force Base	2.116	65	8.3	86.0	149	3	0.2
City of Homestead	0.893	181	34	82.3	248	8	0.1
South Dade Labor Camp	0.126	731	6	99.2	6	2	0.1
Redlands Labor Camp[2]	0.057	652	28	91.9	35	9	0.5
Leisure City[2]	0.296	413	71	81.7	169	9	0.2
Atlantic Ocean							
Virginia Key-City of Miami	40.3	580	61	89.8	19,100	10	0.1
North Miami	13.5	96	-	-	10,833	1.5	-
Sunny Isles	1.5	79	-	-	990	2	-
Miami Beach	21.8	130	-	-	23,635	8	-

[1] Contributes 40 percent to surface water, 60 percent to ground water.
[2] Ground water discharge.

Table A-4.--Average Concentrations and Effluent Load for Major Municipal Waste Sources for Dade County, Florida
Nitrogen, Phosphorus and Chlorides--Continued

Facility	Flow MGD	Kheldahl Nitrogen as N		Ammonia Nitrogen as N		Organic Nitrogen as N		NO_2+NO_3 as N		Total Phosphorus as P		Chloride
		Effluent mg/1	Load lb/day	Effluent mg/1	Load lb/day	Effluent mg/1	Load lb/day	Effluent mg/1	Load lb/day	Effluent mg/1	Load lb/day	mg/1
Black Creek Drainage												
South Miami Heights	1.089	22.2	202	18.0	164	4.2	38	1.1	10	13.6	123	N.D.[3/]
Cutler Ridge	2.195	9.3	172	7.4	135	2.0	37	0.9	18	10.0	185	69
Bell Aire S.D.[1/]	0.423	24.1	85	19.9	70	4.2	15	0.8	3	10.2	36	40
South Bay Drainage												
Homestead Air Force Base	2.116	3.5	60	2.0	34	1.5	25	6.8	119	6.9	119	119
City of Homestead	0.893	14.4	104	11.3	82	3.1	22	5.7	42	13.6	98	72
South Dade Labor Camp	0.126	13.3	14	8.5	9	4.9	5	2.3	2	7.4	2	47
Redlands Labor Camp[2/]	0.057	4.4	6	2.3	3	2.1	3	10.6	13	9.0	11	43
Leisure City[2/]	0.296	43.4	107	13.1	33	30.3	75	0.7	2	19.8	49	53
Atlantic Ocean												
Virginia Key-City of Miami	40.3	19.0	6,392	14.1	4,744	5.1	1,716	0.06	20	8.6	2,890	1,048
North Miami	13.5	12.7	1,433	6.5	734	6.2	700	.013	1.5	4.6	519	
Sunny Isles	1.5	38.4	481	26.4	331	12.0	78	0.025	.3	8.0	100	1,353
Miami Beach	21.8	26.4	4,799	19.0	3,454	7.4	1,349	0.048	8	8.8	1,599	979

1/ Contributes 40 percent to surface water, 60 percent to ground water.
2/ Ground water discharge.
3/ No data.

Table A-4.--Average Concentrations and Effluent Load for Major Municipal Waste Sources for Dade County, Florida
Nitrogen, Phosphorus and Chlorides

Facility	Flow	Kjeldahl Nitrogen as N		Ammonia Nitrogen as N		Organic Nitrogen as N		NO_2+NO_3 as N		Total Phosphorus as P		Chloride
	MGD	Effluent mg/l	Load lb/day	Effluent mg/l	Load lb/day	Effluent mg/l	Load lb/day	Effluent mg/l	Load lb/day	Effluent mg/l	Load lb/day	mg/l
Snake Creek Drainage												
Andover	1.714	5.6	79	3.8	53	1.8	26	10.0	140	7.6	107	67
Carol City	2.030	21.8	368	17.4	296	4.3	73	2.2	37	9.0	154	36
Riverside Estates	0.362	11.0	31	1.9	6	9.0	25	16.0	46	16.4	50	43
Golden Isles	0.642	24.0	129	21.4	115	2.6	14	0.08	0.4	11.1	60	114
Myrtle Grove-City of North Miami	1.645	25.6	352	23.3	320	2.3	32	0.01	0.1	10.8	149	69
Country Club of Miami	0.185	1.8	2.8	0.5	0.8	1.3	2	1.3	2.0	6.8	11	30
Palm Springs North S.D.	0.447	26.3	98	25	93	1.3	4	0.5	2.0	13.7	51	68
Biscayne Canal and Little River Canal Drainage												
Miami Lakes Utilities	0.727	18.0	109	13.9	84	4.1	25	1.7	10.0	13.0	80	75
Seaboard Industrial Park	0.117	3.1	3	4.7	5	3.7	4	0.05	0.05	6.6	7	62
Opa Locka Airport-Dade County Port Authority	0.183	4.8	7.3	1.88	2.9	N.D.	N.D.	25.0	38.2	9.2	14.1	192
Miami River Drainage												
Atomic Sewerage	0.024	19.0	4	8.0	2	11.0	2	0.3	0.1	7.5	2	116
Doral Country Club	0.215	10.8	19	5.0	9	5.8	10	1.3	3	6.7	13	55
Coral Gables Waterway												
Lil' Abner Trailer Park	0.072	26.7	16	19.5	12	7.2	4	0.6	0.1	15.2	9	79
Pan American Hospital	0.036	1.9	0.6	0.7	0.2	1.2	0.4	12.4	4	2.1	0.6	118
Community Utilities	2.471	15.3	315	14.5	300	0.8	16	4.4	90	7.2	149	46
Snapper Creek Drainage												
Peninsular Utilities	2.500	20.5	427	19.4	405	1.3	27	0.02	0.1	9.4	195	36
Southern Estates	1.428	13.5	161	11.4	135	2.2	26	0.9	10	8.7	104	45
Westwood Lakes	1.970	25.1	413	19.2	316	5.9	97	0.26	4	11.8	194	57

Table A-5.--Median MPN and Average of Field Observations for Municipal Waste Source in Dade County, Florida

Facility	Flow MGD	Coliform Total MPN	Coliform Fecal MPN	Influent Temperature °C.	Influent pH S.U.	Effluent Temperature °C	Effluent pH S.U.	Effluent Chlorine Residual
Snake Creek Drainage								
Andover	1.714	20	18	26	7.6	24	6.8	2.0
Carol City	2.030	18	18	26	7.3	25	6.9	4.0
Riverdale Estates	0.362	18	18	26	7.5	23	4.6	6.8
Golden Isles	0.642	18	18	25	7.2	24	6.5	2.3
Myrtle Grove-City of North Miami	1.645	18	18	25	7.0	23	6.6	2.2
Country Club of Miami	0.185	20	18	24	6.5	23	6.5	1.0
Palm Springs North S.D.	0.447	18	18	25	7.2	23	6.7	1.8
Biscayne Canal and Little River Canal Drainage								
Miami Lakes Utilities	0.727	2,700,000	350,000	26	8.3	26	8.1	2.6
Seaboard Industrial Park	0.117			26	7.1	23	6.0	3.5
Opa Locka Airport-Dade County Port Authority	0.183			23	6.7	21	6.4	0
Miami River Drainage								
Atomic Sewerage	0.024	18	18	25	7.8	23	7.410	
Doral Country Club	0.215	20	20	29	6.8	28	6.8	4.2
Coral Gables Waterway								
Lil' Abner Trailer Park[1/]	0.072			25	7.8	22	6.6	N.D.
Pan American Hospital	0.036	18	18	29	7.3	25	5.7	3.4
Community Utilities	2.471	18	18	26	9.7	26	9.8	2.0
Snapper Creek Drainage								
Peninsular Utilities	2.500			26	8.3	25	8.1	4.4
Southern Estates	1.428	620	1,100	25	8.4	24	8.1	2.8
Westwood Lakes	1.970			24	7.8	23	6.7	2.5

Table A-5.--Median MPN and Average of Field Observations for Municipal Waste Source in Dade County, Florida--Continued

Facility	Flow MGD	Coliform Total MPN	Coliform Fecal MPN	Influent Temperature °C	Influent pH S.U.	Effluent Temperature °C	Effluent pH S.U.	Effluent Chlorine Residual
Black Creek Drainage								
South Miami Heights	1.089	410	32	26	7.2	27	7.0	1.1
Cutler Ridge	2.195	18	18	27	7.1	27	7.0	1.8
Bell Aire S.D.[2]	0.423			24	7.4	22	6.6	1.5
South Bay Drainage								
Homestead Air Force Base	2.116	170	45	25	7.2	25	6.9	.5
City of Homestead	0.893	490	93	26	7.7	26	7.4	2.2
South Dade Labor Camp	0.126			23	6.7	21	6.5	3.3
Redland Labor Camp[3]	0.057	18	18	26	7.3	25	7.3	2.3
Leisure City[3]	0.296	40	18					
Atlantic Ocean								
Virginia Key-City of Miami	40.3	1,300	78	28	6.8	28	6.8	0.4
North Miami	13.5	ND	ND	ND	ND	ND	ND	ND
Sunny Isles	1.5	ND	ND	ND	ND	ND	ND	ND
Miami Beach	21.8	ND	ND	ND	ND	ND	ND	ND

[1] Single sample.
[2] Contributes 40 percent to surface water, 60 percent to ground water.
[3] Ground water discharge.
ND Not determined.

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Table A-6.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Biochemical Oxygen Demand and Total Suspended Solids

	Sewage Treatment Plant	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
	A. Atlantic Ocean & Biscayne Bay									
A-1	Coast Guard Station	0.0144	390	8	97.9	0.96	156	112	28.2	13.45
A-2	Shores Condominium	0.0200	333	59	82.3	9.84	200	80	60.0	13.34
	B. Snake Creek									
B-1	Dade Christian Schools	0.0150	136	42	69.1	5.25	72	13	81.9	1.63
	C. Biscayne Canal & Little River									
C-1	Food Fair Store #291	0.0150	276	3	98.9	0.38	896	46	94.9	5.75
C-2	Barry College	0.0300	204	29	85.8	7.26	356	46	87.0	11.51
C-3	Monsignor Pace High School	0.0300	130	17	86.9	4.25	104	34	67.3	8.51
C-4	Del-Ray Gardens	0.0060	225	12.5	94.4	0.62	124	14	88.7	0.70
C-5	Palm Springs Hospital	0.0140	152	29.0	80.9	3.39	202	21	89.6	2.45
C-6	Palm Springs Garden Condominium	0.0200	173.3	40.6	76.8	6.50	212	75.5	64.1	12.00
	D. Miami River									
D-1	Winn Dixie Stores	--	>770	--	--	--	2488	--	--	--
D-2	Hialeah City Hall	0.0400	272	26	90.4	8.68	296	52	82.4	17.35
D-3	Hialeah Hospital	0.0900	296	23	92.2	17.26	148	13	91.2	9.76
D-4	Hialeah Convalesent	0.0250	304	94	69.1	19.60	238	142	40.3	29.61

Table A-6.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Biochemical Oxygen Demand and Total Suspended Solids --Continued

	Sewage Treatment Plant	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
D-5	Kings Inn	0.0200	71.9	11.5	84.0	1.92	50	26	48.0	4.34
D-6	Holiday Inn	0.0250	194	1.96	98.7	0.41	40	10.4	74.0	2.17
D-7	Airport Lanes	0.0110	244	7	97.2	0.62	134	10	92.5	0.92
D-8	Midway Mall	0.0600	259	4	98.3	2.25	384	47	87.8	23.50
D-9	Air Traffic Control	0.0090	552	2.8	99.5	0.21	512	80	84.4	6.0
D-10	Howard Johnsons	0.0250	375	7.8	97.9	1.63	500	13	97.4	2.71
D-11	My-Am-Ee Trailer Park	0.0300	575	21.5	96.3	5.38	840	25	97.0	6.26
D-12	Blue Lake Trailer Park	0.0340	212	4.0	98.0	1.19	404	52	87.1	14.74
D-13	Medley Mobile Park	0.0030	241	10.0	95.9	0.25	122	27	77.9	0.68
D-14	Saratoga Springs Apartments	0.0130	159	76.0	52.2	8.24	776	88	88.7	9.54
D-15	Queen's Inn Hotel	—	73	10.0	86.3	—	102	20	80.4	—
D-16	79th Street Shopping Center	—	249	18.0	92.8	—	228	28	87.7	—
D-17	American Hospital Supply	0.0300	77	5.2	93.2	1.30	16	12	25.0	3.0
D-18	Miami Springs High School	0.0200	234	66.0	71.8	11.00	138	130	5.8	21.68
D-19	Country Club Garden Apartments	0.0200	251	3.8	98.5	0.63	198	27	86.4	4.50
	E. Coral Gables Waterway									
E-1	Westchester Hospital	0.0150	665	15	97.8	1.82	800	114	85.8	14.26

Table A-6.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Biochemical Oxygen Demand and Total Suspended Solids --Continued

	Sewage Treatment Plant	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
E-2	Goldberg Apartments	0.0100	212	8.5	96.0	0.71	108	22	79.6	1.83
E-3	Biltmore Hotel	---	10	1.2	88.0	—	26	10	61.5	—
E-4	Ludlam Plaza Apartments	0.0125	177	0.4	99+	0.4	42	12	0	1.25
	F. Snapper Creek									
F-1	Florida Portland Cement	0.0045	77	8	89.6	0.3	452	14	96.9	0.52
F-2	Jade Garden Apartments	--	531	5	99.1	—	4116	14	99.7	--
F-3	Miller Lake Apartments	0.0030	158	46	70.9	1.15	124	26	79	0.65
F-4	Lakeview Garden Apartments	0.0300	219	24	89.0	6.0	72	26	63.9	6.5
F-5	Kendale Lakes	0.0500	192	6	96.9	2.5	92	10	89.1	4.2
F-6	Kendale Complex	--	313	47	85.0	—	90	98	—	—
	G. Black Creek									
G-1	Camp Matecumbe	0.0350	130	7	94.5	2.10	104	10	90.4	2.90
G-2	Casa Granada Apartments	0.0200	179	6	96.4	1.07	208	6	97.1	1.00
G-3	El Rancho Apartments	0.0200	242	9	96.5	1.43	232	13	94.4	2.17
G-4	Naval Air Station	--	39.5	27	31.6	—	48	26	45.8	—
	H. South Bay									
H-1	Redlands Mobile Home Park	0.0150	365	17.4	95.2	2.18	332	21	93.7	2.63

Table A-6.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Biochemical Oxygen Demand and Total Suspended Solids--Continued

	Sewage Treatment Plant	Flow MGD	Biochemical Oxygen Demand				Total Suspended Solids			
			Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day	Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day
H-2	Helman Court Apartments	0.0250	>717	24	>96.7	4.98	496	166	66.5	34.60
H-3	Sweden House	0.0200	63	17.5	72.2	2.92	14	4	71.4	0.67
H-4	Steak & Brew Resturant	0.0150	>1240	10	>99.2	1.29	2790	30	98.9	3.75
H-5	Sea Glades Motel	--	133	23	82.7	--	90	30	67	--

Table A-7.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Chemical Oxygen Demand and Total Organic Carbon

	Sewage Treatment Plant	Flow MGD	Chemical Oxygen Demand				Total Organic Carbon			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
	A. Atlantic Ocean & Biscayne Bay									
A-1	Coast Guard Station	0.0144	630	88	86.0	10.57	154	24	84.4	2.88
A-2	Shores Condominium	0.0200	713	223	68.7	37.20	165	55	66.7	9.17
	B. Snake Creek									
B-1	Dade Christian Schools	0.0150	573	120	79.1	15.01	110	27	75.5	3.38
	C. Biscayne Canal & Little River									
C-1	Food Fair #291	0.0150	604	60	90.1	7.50	155	15	90.3	1.88
C-2	Barry College	0.0300	636	66	89.6	16.52	65	21	67.7	5.25
C-3	Monsignor Pace High School	0.0300	666	57	91.4	14.26	105	19	81.9	4.75
C-4	Del-Ray Gardens	0.0060	803	31	96.1	1.55	165	5	97.3	0.25
C-5	Palm Springs Hospital	0.0140	718	137	80.9	16.00	72	44	39.3	5.13
C-6	Palm Springs Garden Condominium	0.0200	594	98	83.5	16.00	85.2	21.3	74.3	3.5
	D. Miami River									
D-1	Winn Dixie Stores	--	4218	--	--	--	1160	--	--	--
D-2	Hialeah City Hall	0.0400	800	134	83.2	44.7	125	44	64.8	14.68
D-3	Hialeah Hospital	0.0900	646	292	54.8	219.18	155	18	88.4	13.51
D-4	Hialeah Convalesent	0.0250	745	264	64.6	55.04	115	85	26.1	17.72

Table A-7.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Chemical Oxygen Demand and Total Organic Carbon--Continued

	Sewage Treatment Plant	Flow MGD	Chemical Oxygen Demand				Total Organic Carbon			
			Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day	Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day
D-5	Kings Inn	0.0200	297	69	76.8	11.51	50	28	44.0	4.67
D-6	Holiday Inn	0.0250	534	46	91.4	9.59	118	16	86.4	3.34
D-7	Airport Lanes	0.0110	470	34	92.8	3.12	113	10	91.2	0.92
D-8	Midway Mall	0.0600	659	38	94.2	19.00	158	9	94.3	4.50
D-9	Air Traffic Control	0.0090	1135	40	96.5	3.00	340	9	97.4	0.68
D-10	Howard Johnsons	0.0250	1460	66	95.9	13.76	202.5	27	86.7	5.63
D-11	My-Am-Ee Trailer Park	0.0300	2395	100	95.8	25.00	230	57	75.2	14.26
D-12	Blue Lake Trailer Park	0.0340	679	54	92.1	15.31	105	20	81.0	5.67
D-13	Medley Mobile Home Park	0.0030	747	54	92.8	1.35	118	24	79.7	0.60
D-14	Saratoga Springs Apartments	0.0130	939	154	83.4	16.69	145	45	69.0	4.88
D-15	Queens Inn Hotel	—	245	69	71.8	—	37	14	62.2	--
D-16	79th Street Shopping Center	--	967	79	91.8	—	145	20	86.2	--
D-17	American Hospital Supply	0.0300	134	39	70.9	9.76	125	13	89.6	3.25
D-18	Miami Springs High School	0.0200	638	221	65.4	36.86	135	55	59.3	9.17
D-19	Country Club Garden Apartments	0.0200	648	35	94.6	5.84	160	13	91.9	2.17
	E. Coral Gables Waterway									
E-1	Westchester Hospital	0.0150	479	475	0.8	59.42	200	32	83.8	4.06

Table A-7.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Chemical Oxygen Demand and Total Organic Carbon--Continued

	Sewage Treatment Plant	Flow MGD	Chemical Oxygen Demand				Total Organic Carbon			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
E-2	Goldberg Apartments	0.0100	626	91	85.5	7.59	135	20	85.2	1.67
E-3	Biltmore Hotel	—	575	17	97.0	—	11	11	0	—
E-4	Ludlam Plaza Apartments	0.0125	483	43	91.1	4.48	78	18	76.9	1.88
	F. Snapper Creek									
F-1	Florida Portland Cement	0.0045	507	95	81.3	3.56	175	41	76.6	1.54
F-2	Jade Garden Apartments	—	8671	49	99.4	—	1125	22	98.0	—
F-3	Miller Lake Apartments	0.0030	397	136	65.7	3.4	60	42	30	1.05
F-4	Lakeview Garden Apartments	0.0300	601	34	94.3	8.5	250	13	94.8	3.25
F-5	Kendale Lakes	0.0500	480	26	94.6	10.87	145	15	98.7	6.3
F-6	Kendale Complex	—	714	177	75	—	155	85	45.0	—
	G. Black Creek									
G-1	Camp Matecumbe	0.0350	572	24	95.8	7.00	92	9	90.3	2.63
G-2	Casa Granada Apartments	0.0200	565	26	95.4	4.34	95	22	76.3	3.75
G-3	El Rancho Apartments	0.0200	626	28	95.5	4.67	262	30	88.4	5.09
G-4	Naval Air Station	—	624	66	89.4	—	37	12	67.6	—
	H. South Bay									
H-1	Redlands Mobile Home Park	0.0150	680	61	91.0	7.63	92.5	24	74.1	3.0
H-2	Helman Court Apartments	0.0250	1526	86	94.5	17.90	350	19	94.6	3.96

Table A-7.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Chemical Oxygen Demand and Total Organic Carbon--Continued

	Sewage Treatment Plant	Flow MGD	Chemical Oxygen Demand				Total Organic Carbon			
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day
H-3	Sweden House	0.0200	498	44	91.2	7.34	25.5	37.5	--	6.26
H-4	Steak & Brew Resturant	0.0150	20,533	53	99.7	6.63	2400	20	99.2	2.50
H-5	Sea Glades Motel	--	370	131	64.6	--	65	34	47.7	--

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Table A-8.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Volatile Suspended Solids and Settleable Solids

	Sewage Treatment Plant	Flow MGD	Volatile Suspended Solids				Settleable Solids		
			Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day	Inf. mg/l	Eff. mg/l	Removal %
	A. Atlantic Ocean & Biscayne Bay								
A-1	Coast Guard	0.0144	138	92	33.3	11	2.5	0	100
A-2	Shores Condominium	0.0200	180	36	80.0	6.0	2.5	4.0	—
	B. Snake Creek								
B-1	Dade Christian Schools	0.0150	—	—	—	—	0.3	0	100
	C. Biscayne Canal & Little River								
C-1	Food Fair Store #291	0.0150	36	36	0	4.5	0.0	0.0	—
C-2	Barry College	0.0300	236	36	84.8	9.0	5.0	0.3	94
C-3	Monsignor Pace High School	0.0300	—	—	—	—	0.2	0.1	50.0
C-4	Del-Ray Gardens	0.0060	110	13.4	87.8	0.7	0.2	0	100
C-5	Palm Springs Hospital	0.0140	192	17	91.1	2.0	3.0	0.1	96.7
C-6	Palm Springs Garden Condominium	0.0200	109	100.5	17.8	17.5	3.0	0	100
	D. Miami River								
D-1	Winn-Dixie Stores	—	0	—	—	—	7.5	—	—
D-2	Hialeah City Hall	0.0400	—	—	—	—	15.0	0.1	99.3
D-3	Hialeah Hospital	0.0900	—	—	—	—	2.5	0	100
D-4	Hialeah Convalescent	0.0250	—	—	—	—	1.0	5.0	—

Table A-8.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Volatile Suspended Solids and Settleable Solids -- Continued

	Sewage Treatment Plant	Flow MGD	Volatile Suspended Solids				Settleable Solids		
			Inf. mg/l	Eff. mg/l	Removal %	Load lbs/day	Inf. mg/l	Eff. mg/l	Removal %
D-5	Kings Inn	0.0200	22	3	86.4	0.5	2.5	NIL	100
D-6	Holiday Inn	0.0250	20	8	60.0	1.7	3.5	0.1	97.1
D-7	Airport Lanes	0.0110	88	8	90.9	0.7	0.5	0.0	100
D-8	Midway Mall	0.0600	84	43	48.8	21.5	3.0	0.0	100
D-9	Air Traffic Control	0.0090	12	11	8.3	0.8	>40	0.0	100
D-10	Howard Johnsons	0.0250	430.5	12	97.2	2.5	16	0.1	99.4
D-11	My-Am-Ee	0.0300	740	27	96.4	6.8	740	0.2	99.9
D-12	Blue Lake Trailer Park	0.0340	392	40	89.8	11.34	1.4	0.7	50.0
D-13	Medley Mobile Home Park	0.0030	116	24	79.3	0.6	0.7	0.1	85.7
D-14	Saratoga Springs Apartments	0.0130	760	112	85.3	12.1	5	0.5	90
D-15	Queens Inn Hotel	--	52	12	76.9	--	0.5	0	100
D-16	79th Street Shopping Center	--	192	20	89.6	--	4	0	100
D-17	American Hospital Supply	0.0300	12	8	33.3	2.0	0.2	0	100
D-18	Miami Springs High School	0.0200	94	82	12.8	13.7	2.5	3.0	--
D-19	Country Club Garden Apartments	0.0200	126	20	84.1	3.3	2.5	0	100
	E. Coral Gables Waterway								
E-1	Westchester Hospital	0.0150	740	104	86.0	13.01	>40.0	0.2	99.5

Table A-8.--Average Efficiencies and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Volatile Suspended Solids and Settleable Solids -- Continued

	Sewage Treatment Plant	Flow MGD	Volatile Suspended Solids				Settleable Solids		
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %
E-2	Goldberg Apartments	0.0100	96	18	81.5	1.5	0	0	—
E-3	Biltmore Hotel	--	20	6	70.0	--	0.1	0	100
E-4	Ludlam Plaza Apartments	0.0125	10	8	20.0	0.83	0.1	0	100
	F. Snapper Creek Canal								
F-1	Florida Portland Cement	0.0045	424	4	99.1	0.15	0.8	0	100
F-2	Jade Gardens Apartments	--	3768	10	99.7	--	18	0.1	99.4
F-3	Miller Lake Apartments	0.0030	96	14	85.4	0.35	2	0	100
F-4	Lakeview Garden Apartments	0.0300	56	12	78.6	3.0	0.3	0	100
F-5	Kendale Lakes	0.0500	68	6	91.2	2.5	6	0	100
F-6	Kendale Complex	--	66	90	--	--	0.5	0.2	60
	G. Black Creek								
G-1	Camp Matecumbe	0.0350	84	8	90.5	2.34	0.5	0.1	80.0
G-2	Casa Granada Apartments	0.0200	176	2	98.9	0.33	3.0	0	100
G-3	El Rancho Apartments	0.0200	152	6	96.1	1.0	6.0	0	100
G-4	Naval Air Station	--	34	12	64.7	--	0.5	0	100
	H. South Bay								
H-1	Redlands Mobile Home Park	0.0150	86	14	83.7	1.75	6	NIL	100

Table A-8.--Average Efficiencies and Loadings for Minor Wastewater Treatment Plants in Dade County, Florida

Volatile Suspended Solids and Settleable Solids--Continued

	Sewage Treatment Plant	Flow MGD	Volatile Suspended Solids				Settleable Solids		
			Inf. mg/1	Eff. mg/1	Removal %	Load lbs/day	Inf. mg/1	Eff. mg/1	Removal %
H-2	Helman Court Apartments	0.0250	448	156	65.2	32.50	4.0	0.1	97.5
H-3	Sweden House	0.0200	6	4	33.3	0.68	1	NIL	100
H-4	Steak & Brew Resturant	0.0150	2770	16	99.4	2.0	>40.0	0	100
H-5	Sea Glades Motel	--	92	21	77	--	6	0.1	98.3

Table A-9.--Average Effluent Concentrations and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Nitrogen and Phosphorus

	Sewage Treatment Plant	Flow MGD	Kjeldahl Nitrogen		Ammonia Nitrogen		Organic Nitrogen		Nitrite Nitrate N		Total Phosphorus	
			Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day
	A. Atlantic Ocean & Biscayne Bay											
A-1	Coast Guard Station	0.0144	3.5	0.42	1.8	0.22	1.7	0.20	9.8	1.18	12.1	1.45
A-2	Shores Condominium	0.0200	20.2	3.37	1.0	0.17	19.2	3.20	0.2	0.03	10.4	1.73
	B. Snake Creek											
B-1	Dade Christian Schools	0.0150	9.5	1.19	8.0	1.00	1.5	0.19	136.0	17.01	6.5	0.81
	C. Biscayne Canal & Little River											
C-1	Food Fair Store #291	0.0150	2.2	0.28	0.3	0.04	1.9	0.24	15.0	1.88	5.6	0.70
C-2	Barry College	0.0300	5.9	1.48	3.4	0.85	2.5	0.62	11.4	2.85	9.3	2.32
C-3	Monsignor Pace High School	0.0300	7.3	1.83	6.0	1.50	1.3	0.32	28.5	7.13	8.5	2.13
C-4	Del-Ray Gardens	0.0060	1.1	0.055	0.02	0.001	1.08	0.054	0.6	0.03	7.2	0.36
C-5	Palm Springs Hospital	0.0140	18.1	2.11	6.6	0.77	11.5	1.34	0.2	0.023	9.8	1.14
C-6	Palm Springs Garden Condominium	0.0200	17.7	3.00	15.3	2.50	2.4	0.50	2.7	0.50	9.6	1.50
	D. Miami River											
D-1	Winn Dixie Stores	--	--	--	--	--	--	--	--	--	--	--
D-2	Hialeah City Hall	0.0400	14.6	4.87	12.0	4.0	2.6	0.87	4.0	1.33	7.1	2.37
D-3	Hialeah Hospital	0.0900	8.1	6.08	9.0	6.76	None	--	10.5	7.80	7.0	5.25
D-4	Hialeah Convalescent Home	0.0250	25.5	5.32	19.0	3.96	6.5	1.36	0.5	0.10	6.1	1.27

Table A-9.--Average Effluent Concentrations and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Nitrogen and Phosphorus -- Continued

	Sewage Treatment Plant	Flow MGD	Kjeldahl Nitrogen		Ammonia Nitrogen		Organic Nitrogen		Nitrate Nitrate N		Total Phosphorus	
			Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day
D-5	Kings Inn	0.0200	14.0	2.34	11.2	1.87	2.8	0.47	13.0	2.17	5.2	0.87
D-6	Holiday Inn	0.0250	20.2	4.21	16.8	3.50	3.4	0.71	1.8	0.38	8.8	1.83
D-7	Airport Lanes	0.0100	8.4	0.77	7.8	0.72	0.6	0.055	20.0	1.84	6.6	0.60
D-8	Midway Mall	0.0600	1.7	0.85	1.0	0.50	0.7	0.35	3.4	1.70	0.8	0.40
D-9	Air Traffic Control	0.0090	14.8*	1.11	20.0*	1.50	—	—	120.0	9.00	2.8	0.21
D-10	Howard Johnsons	0.0250	10.6	2.21	9.6	2.00	1.0	0.20	3.2	0.67	1.7	0.35
D-11	My-Am-Ee Mobile Home Park	0.0300	11.8	2.95	8.9	2.23	2.9	0.73	0.2	0.05	15.3	3.83
D-12	Blue Lakes Trailer Park	0.0340	3.1	0.88	0.5	0.14	2.6	0.74	1.6	0.45	14.3	4.05
D-13	Medley Mobile Home Court	0.0030	3.4	0.08	2.2	0.06	1.2	0.03	0.4	0.01	8.8	0.22
D-14	Saratoga Springs Apartments	0.0130	10.5	1.14	2.8	0.30	7.7	0.83	12.4	1.34	6.9	0.75
D-15	Queens Inn Hotel	—	26.2	—	18.4	—	7.8	—	0.1	—	5.8	—
D-16	79th Street Shopping Center	—	2.4	—	0.2	—	2.2	—	40.0	—	24.0	—
D-17	American Hospital Supply	0.0300	1.3	0.32	0.8	0.20	0.5	0.12	3.8	0.95	0.4	0.10
D-18	Miami Springs High School	0.0200	55.1	9.19	43.2	7.20	11.9	1.98	0.03	0.005	9.0	1.50
D-19	Country Club Garden Apartments	0.0200	2.1	0.35	0.5	0.083	1.6	0.267	7.8	1.30	5.5	0.92
E.	Coral Gables Waterway											
E-1	Westchester Hospital	0.0150	8.4	1.05	6.2	0.78	2.2	0.28	1.1	0.14	5.7	0.72

Table A-9.--Average Effluent Concentrations and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Nitrogen and Phosphorus -- Continued

	Sewage Treatment Plant	Flow MGD	Kjeldahl Nitrogen		Ammonia Nitrogen		Organic Nitrogen		Nitrite Nitrate N		Total Phosphorus	
			Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day	Conc. mg/1	Load lbs/day
E-2	Goldberg Apartments	0.0100	19.7	1.64	16.8	1.40	2.9	0.24	19.2	1.60	11.9	0.99
E-3	Biltmore Hotel	—	0.6	—	0.2	—	0.4	—	0.05	—	0.02	—
E-4	Ludlam Plaza Apartments	0.0125	3.5	0.36	2.3	0.24	1.2	0.12	23.0	2.40	13.6	1.42
	F. Snapper Creek											
F-1	Florida Portland Cement	0.0045	2.1	0.08	0.08	0.003	2.02	0.076	9.4	0.35	5.8	0.22
F-2	Jade Gardens Apartments	—	15.1	—	14.8	—	0.3	—	0.1	—	9.0	—
F-3	Miller Lake Apartments	0.0030	22.3	0.56	20.0	0.50	2.3	0.058	0.04	0.001	12.1	0.30
F-4	Lakeview Garden Apartments	0.0300	4.8	1.20	3.1	0.78	1.7	0.42	2.2	0.55	11.2	2.80
F-5	Kendale Lakes	0.0500	1.2	0.50	0.04	—	1.16	0.05	0.78	0.30	5.1	2.10
F-6	Kendale Complex	—	8.5	—	4.98	—	—	—	0.01	—	2.3	—
	G. Black Creek											
G-1	Camp Matecumbe	0.0350	1.1	0.32	0.4	0.12	0.7	0.20	13.8	4.03	3.8	1.11
G-2	Casa Granada Apartments	0.0200	—	—	1.8	0.30	—	—	4.8	0.80	8.0	1.33
G-3	El Rancho Apartments	0.0200	2.5	0.42	1.0	0.17	1.5	0.25	16.4	2.74	3.6	0.60
G-4	Naval Air Station	—	10.0	—	9.1	—	0.9	—	0.01	—	7.1	—
	H. South Bay											
H-1	Redlands Mobile Home Park	0.0150	14.8	1.85	13.6	1.70	1.2	0.15	0.2	0.025	8.4	1.05

Table A-9.--Average Effluent Concentrations and Effluent Load for Minor Wastewater Treatment Plants, Dade County, Florida

Nitrogen and Phosphorus -- Continued

	Sewage Treatment Plant	Flow MGD	Kjeldahl Nitrogen		Ammonia Nitrogen		Organic Nitrogen		Nitrite Nitrate N		Total Phosphorus	
			Conc. mg/l	Load lbs/day	Conc. mg/l	Load lbs/day	Conc. mg/l	Load lbs/day	Conc. mg/l	Load lbs/day	Conc. mg/l	Load lbs/day
H-2	Helman Court Apartments	0.0250	14.3	2.98	6.4	1.33	7.9	1.65	4.0	0.83	7.7	1.60
H-3	Sweden House	0.0200	3.1	0.52	1.0	0.17	2.1	0.35	1.0	0.17	12.0	2.00
H-4	Steak & Brew Resturant	0.0150	2.5	0.31	1.6	0.20	0.9	0.11	<0.1	<0.01	1.4	0.18
H-5	Sea Glades Motel	--	19.5	--	18.2	--	1.3	--	0.2	--	5.0	--

Table A-10.--Average Temperature, Chlorine Residual, and Chloride Concentration for Minor Wastewater Treatment Plants in Dade County, Florida

	Sewage Treatment Plant	Flow MGD	Temperature Inf. °C	Temperature Eff. °C	Clorine Residual mg/1	Chloride Conc. mg/1
	A. Atlantic Ocean & Biscayne Bay					
A-1	Coast Guard Station	0.0144	86	82	1.0	83
A-2	Shores Condominium	0.0200	27	27	2.0	87
	B. Snake Creek					
B-1	Dade Christian Schools	0.0150	27	27	0.5	136
	C. Biscayne Canal & Little River					
C-1	Food Fair Store #291	0.0150	27	27	2.0	110
C-2	Barry College	0.0300	27	27	0.0	70
C-3	Monsignor Pace High School	0.0300	27	27	1.8	108
C-4	Del-Ray Gardens	0.0060	85	80	10+	104
C-5	Palm Springs Hospital	0.0140	80	80	10+	120
C-6	Palm Springs Garden Condominium	0.0200	26.1	24.9	5	77.2
	D. Miami River					
D-1	Winn Dixie Stores	--	27	--	--	168 in
D-2	Hialeah City Hall	0.0400	27	27	0.9	75 in
D-3	Hialeah Hospital	0.0900	34	27	2.5	108
D-4	Hialeah Convalescent Home	0.0250	27	27	1.5	79

Table A-10.--Average Temperature, Chlorine Residual, and Chloride Concentration for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Sewage Treatment Plant	Flow MGD	Temperature		Clorine Residual mg/1	Chloride Conc. mg/1
			Inf. °C	Eff. °C		
D-5	Kings Inn	0.0200	27	27	5.0	62
D-6	Holiday Inn	0.0250	27	27	10.0	70
D-7	Airport Lanes	0.0110	27	27	5.0	54
D-8	Midway Mall	0.0600	27	27	2.0	46
D-9	Air Traffic Control	0.0090	27	27	10.0	171
D-10	Howard Johnsons	0.0250	--	--	0	119
D-11	My-Am-Ee Mobile Home Park	0.0300	27	27	10.0	54
D-12	Blue Lakes Trailer Park	0.0340	29	27	--	57
D-13	Medley Mobile Home Court	0.0030	85	80	1.5	86
D-14	Saratoga Springs Apartments	0.0130	80°F	80°F	0.1	--
D-15	Queens Inn Hotel	--	80°F	78°F	0.5	61
D-16	79th Street Shopping Center	--	80°F	80°F	<0.1	102
D-17	American Hospital Supply	0.0300	78°F	75°F	2.0	40
D-18	Miami Springs High School	0.0200	84°F	78°F	2.0	104
D-19	Country Club Garden Apartments	0.0200	82°F	78°F	2.0	58
	E. Coral Gables Waterway					
E-1	Westchester Hospital	0.0150	30	27	1.5	39

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Table A-10.--Average Temperature, Chlorine Residual, and Chloride Concentration for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Sewage Treatment Plant	Flow MGD	Temperature Inf. °C	Temperature Eff. °C	Clorine Residual mg/l	Chloride Conc. mg/l
E-2	Goldberg Apartments	0.0100	88	82	0.25	67
E-3	Biltmore Hotel	--	78°F	78°F	0.1	21
E-4	Ludlam Plaza Apartments	0.0125	82	80	0	46
	F. Snapper Creek					
F-1	Florida Portland Cement	0.0045	80°F	80°F	3	103
F-2	Jade Gardens Apartments	--	85	82	0	48
F-3	Miller Lake Apartments	0.0030	86°F	80°F	0.25	71
F-4	Lakeview Garden Apartments	0.0300	85°F	80°F	0.1	43
F-5	Kendale Lakes	0.0500	75	72	0.5	28
F-6	Kendale Complex	--	75	72	2	55
	G. Black Creek					
G-1	Camp Matecumbe	0.0350	27	27	0	40
G-2	Casa Granada Apartments	0.0200	27	27	3.0	86
G-3	El Rancho Apartments	0.0200	27	27	1.5	67
G-4	Naval Air Station	--	78	78	0	318
	H. South Bay					
H-1	Redlands Mobile Home Park	0.0150	27	27	10.0	26

Table A-10.--Average Temperature, Chlorine Residual, and Chloride Concentration for Minor Wastewater Treatment Plants in Dade County, Florida--Continued

	Sewage Treatment Plant	Flow MGD	Temperature		Clorine Residual mg/1	Chloride Conc. mg/1
			Inf. °C	Eff. °C		
H-2	Helman Court Apartments	0.0250	27	27	0.0	43
H-3	Sweden House	0.0200	28	27	0.15	138
H-4	Steak & Brew Resturant	0.0150	27	27	3.0	110
H-5	Sea Glades Motel	--	80	80	1.5	139

APPENDIX 11

RULE 7

REGULATION OF THE USE OF SANITARY AND STORM SEWERS AND THE DISCHARGE OF WATERS AND WASTES INTO UTILITIES' SEWERAGE SYSTEMS.

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RULE 7

REGULATION OF THE USE OF SANITARY AND STORM SEWERS AND THE DISCHARGE OF WATERS AND WASTES INTO UTILITIES' SEWERAGE SYSTEMS

APPROVED AND EFFECTIVE JUNE 20, 1966, BY
RESOLUTION NO. R-606-66 OF THE BOARD OF
COUNTY COMMISSIONERS OF DADE COUNTY, FLORIDA.

RULE 7

Regulating the use of sanitary and storm sewers and the discharge of waters and wastes into utilities sewerage systems, and providing penalties.

SECTION 1: Unless the context specifically indicates otherwise, the meaning of terms used in this rule shall be as follows:

(a) "Sewage Works" is a comprehensive term which includes facilities for collecting, pumping, treating and disposing of sewage.

(b) "Sewage" shall mean a combination of the water carried wastes from dwellings, business buildings, institutions, and industrial establishments. In effect it is the water supply of a community after it has been used and discharged into a sewer.

(c) "Sanitary Sewer" shall mean a sewer which carries sewage and to which storm, surface and ground waters are not intentionally admitted.

(d) "Storm Sewer" shall mean a sewer which carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

(e) "Industrial Wastes" shall mean the liquid wastes from industrial processes as distinct from sanitary sewage.

(f) "Garbage" shall mean solid wastes from the preparation, cooking and dispensing of food and from the handling, storage and sale of produce.

(g) "B.O.D." (denoting Biochemical Oxygen Demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of

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organic matter under standard laboratory procedure in 5 days at 20 degrees Centigrade, expressed in parts per million.

(h) "pH" shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

(i) "Suspended Solids" shall mean solids that either float on the surface of, or are in suspension in water, sewage or other liquids and which are largely removeable by laboratory filtering.

(j) "Person" shall mean any individual, firm, company, association, society, corporation or group.

(k) "P.P.M." shall mean parts per million by weight.

SECTION 2: Prohibited Wastes.

(a) No person shall discharge or cause to be discharged any storm water, surface water, ground water, roof runoff, subsurface drainage, cooling water or unpolluted industrial or commercial process water into any sanitary sewer.

(b) The discharge of cooling water from air conditioning units is prohibited. Cooling water free from bacteria and harmful chemicals should be discharged into storm water sewers. Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described wastes or waters to any public sewer:

1. Any liquid having a temperature higher than 150 degrees Fahrenheit.

2. Any water or waste containing more than 100 p.p.m. or exceed a daily average of 25 p.p.m. of any grease or oil or any oily substance.

3. Any gasoline, benzene, naptha, fuel oil or other flammable or explosive liquid, solid or gas.

4. Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant.

5. Any garbage that has not been properly shredded, which shall mean the wastes from the preparation, cooking and dispensing of food that have been shredded to such degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle size greater than 1/2 inch in any dimension.

6. Any waters or wastes having a pH lower than 5.5 or higher than 9.5 or having any other corrosive property capable of causing damage or hazard to structures, equipment or personnel of the sewage works.

7. Any water or waste containing toxic substances in quantities in excess of the following limits and measured at the point of discharge into the sewer system:

Cyanides - - - - - - - - 0.01 p.p.m.
Copper, total - - - - 0.5 p.p.m.
Chromium, hexavalent - 0.5 p.p.m.
Chromium, total - - - 1.0 p.p.m.
Cadmium - - - - - - - - 0.5 p.p.m.
Zinc, total - - - - - 1.0 p.p.m.

Or any substance that will pass through the sewage treatment plant and exceed the state requirements for the receiving stream.

8. Any water or waste containing phenols in excess of 0.005 p.p.m.

9. Any water or waste containing suspended solids or color of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant, without a special permit.

10. Any toxic radioactive isotopes, without a special permit.

No statement contained in this section shall be construed as prohibiting any special agreement or arrangement, between the utility and any person whereby an industrial waste of unusual strength or character may be admitted into the sanitary sewers for treatment by the utility either before or after pretreatment.

SECTION 3: Admission of Industrial Waste.

(a) Treatment of Industrial Wastes - The economy and desireability of the combined treatment of industrial wastes and sanitary sewage is recognized. However, not all types and quantities of industrial wastes can be so treated. Hence, it shall be the established policy to admit these types and quantities of industrial wastes that are not harmful or damaging to the structures, processes or operation of the sewage works or are not specifically prohibited by this rule.

It is also recognized that to provide this service additional facilities are required and the cost of which must be borne by those persons receiving its benefits.

(b) Approval Required for Industrial Wastes- In order to control the admission of industrial wastes, the discharge into the public sewers of any waters or wastes having:

1. A five day 20 degree Centigrade B.O.D. greater than 300 p.p.m. or
2. A suspended solids content greater than 350 p.p.m., or
3. A chlorine demand greater than 15 p.p.m., or
4. An average daily flow greater than 2% of the average daily sewage flow at the sewage treatment works, or
5. Any toxic substance, or
6. Any wastes which are considered by the Superintendent of the Sewage Treatment Works to offer possibilities or harm to structures, processes, or operation of the plant.

shall be subject to review and approval of the utility.

(c) Sewerage Systems Connected to an Ocean Outfall - When industrial wastes are discharged to a sewerage system utilizing an ocean outfall, items 1 through 3, Section 3(b) shall not be applicable unless it is being treated by a sewage treatment plant where the loading of the biological treatment unit would be a factor.

(d) Survey Data Required - All users of the sewage system who are now discharging industrial wastes to the public sewers shall upon request of the sewage treatment plant Superintendent, fill in and file with the plant superintendent, within three months, a questionnaire — which shall furnish pertinent data, inclusive of quantity of flow and an analysis of the water discharged to the sewage treatment plant.

Similarly any person desiring to make a new connection to the sewage system for the purpose of discharging industrial wastes to the public sewers, shall fill in and file with the sewage treatment plant superintendent an industrial waste questionnaire which shall furnish pertinent or predicted data inclusive of quantity of flow and an analysis of the industrial waste to be discharged into the sewer system.

(e) Sampling and Analysis - Samples shall be a composite sample collected daily over a three day period of operation so as to be a truly representative sample of the actual quality of the wastes. Sample, for analysis, must be collected by the engineer, chemist or his representative. Analysis shall be made by a registered Sanitary Engineer, or a graduate Chemist whose qualifications are acceptable to the Health Department, or Class A & B waste water treatment plant operator, registered in Florida, using the laboratory methods for the examination of industrial waste as set forth in the latest edition of "Standard Methods for Examination of Water and Sewage" as published by the American Public Health Service.

(f) Extension of Time - When, due to the size or complexity of the waste disposal problem of an industry, it can be shown that it is impractical to meet the schedule imposed under Section 3(c) above, a request for an extension of time may be presented to the plant superintendent.

(g) Control Manhole - Any establishment discharging industrial wastes into the sewage system shall construct and maintain at his expense a suitable control manhole, or manholes downstream from any treatment, storage or other approved works, to facilitate observation, measurement and sampling of all wastes, including domestic sewage, from the establishment.

The control manhole or manholes shall be constructed at suitable and satisfactory locations and built in a manner approved by the Sewage Treatment Plant superintendent.

The control manhole shall be accessable to the Sewage Treatment Plant superintendent or his representatives at all times for sampling.

(h) Pretreatment - When required, the user of the utility sewer system shall provide at his expense such preliminary treatment or handling as may be necessary to modify the objectionable characteristics, or constituents to come within the limits set forth in Section 3(b) of this rule.

SECTION 4: The Sewage Treatment Plant Superintendent and other duly authorized employees of the utility bearing proper credentials and identification shall be permitted to enter upon all properties for the purposes of inspection, observation, measurement, sampling and testing in accordance with the provisions of this rule.

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REPORT OF
WASTE SOURCE INVENTORY
AND EVALUATION
DADE COUNTY, FLORIDA

TECHNICAL APPENDIX I
MAJOR MUNICIPAL WASTEWATER
TREATMENT FACILITIES

ENVIRONMENTAL PROTECTION AGENCY
SOUTHEAST REGION
SOUTHEAST WATER LABORATORY
TECHNICAL SERVICES PROGRAM
ATHENS, GEORGIA

JUNE 1971

PREFACE

This Technical Appendix contains field and laboratory data and engineering evaluation reports for each of the twenty-seven major wastewater treatment facilities, two ocean outfall systems which discharge without treatment, and one collection system which discharges without treatment into another system.

No attempt has been made to retabulate or "dress-up" the original field or laboratory work sheets.

Compilation in Technical Appendix form is for the convenience of pollution control agencies. Reports on individual plants may be obtained upon request from:

Technical Programs
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

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Lower Florida Estuary Study
Report on Water Borne Wastes from Andover Waste Water Treatment Plant
(Owned by Ecological Utilities, Inc.)
N.W. Second Avenue and 200th Street
Miami, Dade County, Florida
December 23, 1970

INTRODUCTION

The Andover Waste Water Treatment Plant was surveyed during the period November 29 through December 4, 1970. Two separate complete mix activated sludge units, with individual secondary clarifiers and chlorine contact chambers, are utilized to provide secondary treatment. Combined effluent from these units is treated in a microstrainer, and the effluent flows to the Snake Creek. Serco automatic samplers were utilized to collect five 24-hour composites of the common influent stream and of the effluent from the microstrainer. Bacterial, temperature, pH and chlorine residual were also collected from the microstrainer effluent. Messrs. Terry Davis and George Egermier collected the samples. The primary contact for this plant and the Riverdale Estates plant was Mr. William Conlon of Ecological Utilities, Inc.

SUMMARY AND CONCLUSIONS

The average flow through the Andover Sewage Treatment Plant was 1.71 MGD during the study period. The average concentration five-day biochemical oxygen demand (BOD_5) of the effluent was 20 mg/l and an average of 309 lbs. per day of BOD_5 was discharged to Snake Creek. The average BOD_5 removal efficiency of the plant was 84 percent. An average total suspended solids removal efficiency of 83 percent was calculated during the study and the average concentration in the effluent was 17 mg/l. The median total and fecal coliform concentrations in the effluent were 20 and >18 MPN per 100 ml respectively.

This plant does not meet the Dade County performance criteria for BOD_5 and suspended solids which requires an average removal of 90% with no values less than 85%. On December 4, 1970 only 64.9% of the BOD_5 was removed, and on December 2, 1970 only 61% of the total suspended solids were removed.

The following are recommended to improve the operation of this plant:

1. The flow meters should be extensively tested and repaired or replaced if they are found to malfunction.

2. The skimmings be diverted to the digester, rather than the present method returning to the aeration tanks. This would preclude concentration of the scum forming materials.

3. Operation of the microstrainer should be revised to provide a daily average of no more than 10 mg/l of total suspended solids in the effluent.

INVENTORY

Major components of the plant are:

1. A comminutor, with bar screen in parallel, which services aeration tanks #1 and #2, (old plant), and a similar arrangement which services aeration tank #3 (new plant). The influent sample was taken at the comminutor servicing tanks #1 and #2.

2. Three complete mix activated sludge aeration units. These units are designed for a detention time of 8.4 hours (at flow of 1.7 MGD) with a loading of 24 lbs. BOD/1000 cu. ft. and 90-93% BOD removal.

3. Six secondary clarifiers designed for detention times of 7 hours and 90% removal of suspended solids.

4. Three chlorine contact chambers designed for 30-minute detention time at 200% flow and chlorine residuals of 0.5 to 1.0 ppm.

5. A microstrainer with a 22 micron screen size, continuous rotating screen with backwash, rated at a capacity of 3 MGD and capable of providing an effluent with 10 ppm or less suspended solids over a 24-hour period.

6. Sludge treatment consisting of two stage aerobic digestion with disposal in sludge beds or by dewatering and subsequent trucking to the Dade County dump.

RESULTS

The average daily flow during the study period was 1.71 MGD. However, a study of the flow meters by the plant operators during the week of December 14, 1970 indicates the meters are inaccurate.

The total chlorine residual ranged from 0.5 mg/l to 5.0 mg/l with an average of 2.0 mg/l. The bacterial concentration indicated that the effluent was effectively chlorinated.

The automatic sampler on the influent did not function on November 30, 1970 and the effluent sampler malfunctioned on December 1, 1970. Therefore, there are only three complete sets of efficiency data.

The pollutional strength of this discharge was determined by the five-day biochemical oxygen demand, chemical oxygen demand, and total organic carbon tests. The average BOD_5 value in the effluent was 20 mg/l and the average removal accomplished by this plant was 84 percent. Removals of 91.1 and 94.4% were achieved on December 2 and 3 respectively. However, the efficiency on December 4 was only 64.9%. Based on chemical oxygen demands (COD) the average plant efficiency was 87% and the average plant efficiency based on total organic carbon (TOC) was 82.4%. The average loads of BOD_5, COD and TOC discharged to Snake Creek were 309, 813, and 219 pounds per day respectively.

The average total suspended solids concentration was 17 mg/l in the effluent and the removal efficiency was 83%.

The concentrations of ammonia, organic and nitrite-nitrate nitrogen in the effluent were 3.8, 1.8, and 10.0 mg/l as N respectively. The loads discharged to Snake Creek were 53 lbs. per day of ammonia nitrogen, 26 lbs. per day of organic nitrogen and 140 lbs. per day of nitrite-nitrate nitrogen. The average concentration of total phosphorus in the effluent was 7.6 mg/l and the load discharged was 107 lbs. per day.

The daily values for the physical, chemical and bacteriological data is presented in the attached Field and Data Summary Sheets.

DISCUSSION

General appearance of the plant is excellent. "Housekeeping" and mechanical maintenance was excellent during the survey period. The microstrainer was out of operation for approximately 3 hours, to repair the screens, over the entire sampling period. All other equipment functioned throughout the period. Overall supervision of plant operations is excellent, since the main office of Ecological Utilities, Inc., is located at the site. Laboratory facilities are on site, and serve this plant and the Riverdale Estates plant in Dade County, plus other plants located in Broward County.

One operational problem was that of scum or heavy foam, similar to that in the Riverdale Estates plant. This material carried over into the holding area for the influent into the microstrainer.

Infiltration of ground water into the collection system is a serious problem at this plant, causing hydraulic overloading at peak flows. However, the plant operators are aware of this and have partially corrected the problem.

None of the operators of this plant are certified, although the plant superintendent holds the highest certification given by New York State.

Lawrence W Olinger
LAWRENCE W. OLINGER

Robert L. King
ROBERT L. KING

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Andover

							AVERAGE
DATE ON		29 Nov 70	30 Nov 70	1 Dec 70	2 Dec 76	3 Dec 70	AVERAGE
TIME ON		10:10 A.	1030	1500	1400	1243	
DATE OFF		30 Nov 70	1 Dec 70	2 Dec 70	3 Dec 70	4 Dec 70	
TIME OFF		10:05 A.	10:06 A	1400	1243	1202	
FLOW	START X100	LEFT / RIGHT 3389374/2258879	3398851 2266391	3410692 2276220	3415824 ~~22~~ 2282954	3428842 2290296	
	END X100	3398851/2266391	03408643 02274480	03415821 02282954	3428842 2290296	03436365 02297736	
	TOTAL X100	10477/7512	[illegible]/8089	9179/6734	902[illegible]/7342	7523/7440	
	24 hr. Flow Rate	1,806,427	1,834,974	1,660,487	1,730,009	1,541,253	1,714,630
INF.	TEMP. ~~ON~~ OFF	26.2	~~24.2~~	26.1	26.5	26.3	26.14
	PH · ~~ON~~ OFF	8.3	~~7.1~~ 7.9	7.7	7.13	7.1	7.63
EFFLUENT	TEMP · ~~OFF~~ OFF	24.5	24.2	23.9	24.7	24.4°C	24.34
	PH ~~ON~~ OFF	6.8	7.1	6.6	6.83	6.7	6.81
	Cl. Residual	1.0	.5	1.0	2.5	5.0	2.0
	CHLORINE-ON	765#	220 #	240	400	687	
	CHLORINE-OFF	220#	240	400	687	1127	
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
29 Nov 70	NORMAL	O.K.	15, 16 + 4 Effluent ACTIVATED	Egermier
30 Nov 70	Brown Foam in CL2 Channel NORMAL	O.K.	10 + 11 Influent Activated Eff. #7/20 ml	Changed eff. sampler Eff #6/128 ml
1 Dec 70	Brown Foam in CL2 Channel	Micro Strainer Down from 1130 – 1430	16 - No Sample 13 - Heavier Solids No effluent	
2 Dec 70	Normal Floating Solids on Clarifiers	From 1300-1330 Micro Strainer down due to carryover. Digestor pumped to another Tank	16 Inf. empty	
3 Dec 70	Clear with very light floc.	Heavy Floating Foam in new pit. Clarifiers + CL2 Channel	16 Inf. empty	
4 Dec			#12 + 13 Influent & effluent Engaged at 1130	
	Clear with light vol. of Raised Solids. East Aer. Digester down Usual heavy floating solids on ~~east~~ New Pit Clarifiers	Low flow from ≈ 1900 – 2300	~~Eff~~ Influent	#6 21, 22 ~~#6~~ empty

…v 70 - Timer Arm not Tightened

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Andover S.T.P.

DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE
FLOW - MGD		1.81	1.83	1.66	1.73	1.54	1.71
5 DAY BOD mg/l	INFLUENT	N.S.	209	169	144	134	164
	EFFLUENT	9	N/S	15	8	47	20
	IN - OUT			154	136	87	
	% REMOVAL			91.1	94.4	64.9	84
	LOAD-lbs/day			202	115	604	204
COD mg/l	INFLUENT	NO SAMPLE	576	433	517	406	483
	EFFLUENT	132	NO SAMPLE	80	53	44	77
	IN - OUT			353	464	362	
	% REMOVAL			82	89.7	89.2	87
	LOAD -lbs/day			1107	765	565	913
TSS mg/l	INFLUENT	N.S.	120	72	[illegible]	[illegible]	135
	EFFLUENT	20		27	5	[illegible]	17
	IN - OUT			44	233	127	
	% REMOVAL			61	98	91	83
	LOAD- lbs/day			322	72	167	209
VSS mg/l	INFLUENT	N/S	N.R.	[illegible]	110	128	119
	EFFLUENT	15		[illegible]	[illegible]	[illegible]	12
	IN - OUT			4	[illegible]	117	
	% REMOVAL			20	98	91	70
	LOAD –lbs/day			222	72	141	209
Settlable Solids mg/l	INFLUENT	N/S	13	7	10	7	9
	EFFLUENT	0.1	N/S	0.1	0.1	0.1	0.1
	IN - OUT			6.9	9.9	6.9	
	% REMOVAL			99	99	99	99
TOC mg/l	INFLUENT	N/S	[illegible]	85	120	70	82
	EFFLUENT	22	N/S	20.5	16	11	17.4
	IN - OUT			64.5	104	59	
	% REMOVAL			76	87	84.2	82.4
	LOAD - lbs/day			2[illegible]1	231	141	219

INFLUENT BOD POPULATION EQUIVALENT = 13,758

EFFLUENT BOD POPULATION EQUIVALENT = 1817

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

ONLY

PLANT Andover

DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE or MEDIAN*
FLOW - MGD		1.81	1.83	1.66	1.73	1.54	1.71
KTELDAHL NITROGEN as N	CONC.-mg/l	6.0	N/S	5.6	6.2	4.5	5.6
	LOAD-lbs/day	91	—	78	89	58	79
AMMONIA NITROGEN as N	CONC.-mg/l	4.0	N/S	4.0	4.0	3.0	3.8
	LOAD-lbs/day	60	—	55	58	39	53
ORGANIC NITROGEN as N	CONC.-mg/l	2.0	N/S	1.6	2.2	1.5	1.8
	LOAD-lbs/day	[illegible]	—	22	32	19	26
NO_2 - NO_3 as N	CONC.-mg/l	9.5	N/S	10.0	10.6	9.8	[illegible]
	LOAD-lbs/day	[illegible]		138	153	126	140
TOTAL PHOSPHORUS AS P	CONC.-mg/l	7.8	N/S	8.3	7.0	7.3	7.6
	LOAD-lbs/day	118		115	101	94	107
CHLORIDE	CONC.-mg/l	50.0	---	62.0	58.0	56.0	57
			5'				
TOTAL COLIFORM	CONC. - MPN/100ml	68	20	78	18°	18°	20
Fecal COLIFORM	CONC. - MPN/100ml	15	18°	20	18°	18°	18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

Sheet ___ of _____

DATE OF VISIT: December 1, 1970
PLANT NAME: Andover Waste Water Treatment Plant
PLANT OWNER: Ecological Utilities, Inc.
ADDRESS: N.W. Second Avenue and 200th Street, Miami, Florida
TELEPHONE: 621-7311
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as plant.
ADDRESS:
TELEPHONE:

DESIGN AVERAGE DESIGN FLOW: 1.7 MGD YEAR COMPLETED: 1970
STREAM FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST $896,000
POPULATION SERVED 8,000

OPERATION ANNUAL COST $33,000
PERSONNEL Three operators plus one Superintendent (for this plant and Riverdale Estates).
LEVEL OF CERTIFICATION None for operators - Superintendent has highest classification from New York State.
CONDITION OF EQUIPMENT Excellent

OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Snake Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Two comminutors, three aeration tanks, six final clarifiers, three chlorine contact chambers, and microstrainer.

SLUDGE TREATMENT Two stage aerobic digestion, with portable sludge dewatering unit.

DISPOSAL Truck dewatered sludge to County dump.

REMARKS Infiltration problems but this is being partially alleviated.

ARED BY: Robert L. King

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Andover

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES

First Stage Digester
Aerator

PREPARED BY: Robert L. King

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Lower Florida Estuary Study
Report on Waterborne Wastes from
Atomic Sewerage Plant
6900 N.W. 58th Street
Miami, Dade County, Florida
February 16, 1971

INTRODUCTION

The Atomic Sewerage Plant was surveyed during the period December 14 - 18, 1970. The plant is an activated sludge system, designed to process septic tank wastes, with a three-cell (series) lagoon as a polishing pond system. The effluent flows to the F.E.C. Canal. A Sirco electric sampler was utilized to collect four 24-hour composites of the influent. The effluent was sampled using a Serco automatic sampler at the chlorine contact chamber after the lagoons. Messrs. Terry Davis and George Egermier were the sample collectors. Primary contact was Mr. Drew, the plant owner.

SUMMARY AND CONCLUSIONS

The average quantity of waste treated by the Atomic Sewerage Plant during the study was 25,000 gallons per day. The average influent and effluent five-day biochemical oxygen demand (BOD_5) of the waste was > 1126 and 106 mg/l respectively. The average total suspended solids (TSS) concentration in the influent was 1348 mg/l and the average in the effluent was 124 mg/l. The effluent was effectively chlorinated, since the median total and fecal coliform concentrations were both <18 MPN per 100 ml, and the average chlorine residual was >10 mg/l.

The proposed State of Florida performance criteria requires 90% treatment. The average BOD_5 removal efficiency for this plant was >90% and the minimum removal efficiency was 84%. In addition, an average removal efficiency for TSS of 89% was calculated with a minimum value of 84%. The average values were calculated from the daily values.

INVENTORY

The plant has a design capacity of 72,000 gallons per day of influent at a strength of 700 ppm. Major components are as follows:

1. A surge tank with a capacity of 11,600 gallons. Septic tank wastes are off-loaded from tank trucks to this tank. Wastes are pumped from this tank for 30 minutes each hour to the primary clarifier.
2. A primary clarifier with capacity of 6,950 gallons, designed for approximately 90 minutes detention time.
3. An aeration tank with 9,600 cu. ft. capacity and a blower system capable of delivering 220 cu. ft. of air per minute.
4. A secondary clarifier identical to the primary clarifier.
5. A three-cell lagoon system operated in series, with total area of 28,000 square feet.

6. A chlorine contact chamber with 1,120 gallons capacity, designed for 15 minutes detention time.

7. An anerobic digester with sludge disposal in drying beds. This sludge is stored and used as potting material for flowers.

DISCUSSION OF RESULTS

The Atomic Sewerage Plant treated an average of 25,000 gallons of waste per day, which accounts for 35% of the design flow.

The influent and effluent BOD_5 at this plant averaged >1126 and 106 mg/l respectively. A BOD_5 load of 22 lbs. per day was discharged to the F.E.C. Canal. The average BOD_5 removal efficiency was >90% and the minimum efficiency was 84%. Chemical oxygen demand (COD) and total organic carbon (TOC) tests were also utilized to determine the pollutional strength of this waste. The average removal efficiencies of COD and TOC were 88.4 and 87.4% respectively.

The average influent and effluent TSS concentration during the study were 1348 and 124 mg/l respectively. An average removal efficiency of 89% with a minimum value of 84% was calculated. An average of 15 lbs. per day of volatile suspended solids and 12 lbs. per day of fixed suspended solids were discharged by this plant. An average settleable solids removal efficiency of 99.6% was observed during the study period.

The average concentrations of ammonia nitrogen and organic nitrogen in the waste were 8 and 11 mg/l respectively, and 2 lbs. per day of each of these parameters were discharged. Practically no nitrite-nitrate nitrogen was discharged and 2 lbs. per day of total phosphorus was discharged at a concentration of 7.5 mg/l.

The average chlorine residual in the effluent was >10 mg/l and the median total and fecal coliform concentrations in the effluent were both <18 MPN per 100 ml indicating chlorination of the effluent was effective.

Daily values of all parameters are presented in the attached Field and Data Summary Sheets.

DISCUSSION

In the evaluation of this plant, the unique character of the wastes must be considered. The laboratory data during this study indicates that the BOD_5 was in excess of 1,300 mg/l, on two days during the survey and past laboratory analyses indicated that BOD_5 concentrations were as high as 7,000 mg/l occurred. The influent is high in solids and highly odorous. Considering the nature of the wastes handled, the plant is maintained well and housekeeping is exceptional. The plant is located a sufficient distance from residences and other businesses, so that odor is probably not a problem.

LAWRENCE W. OLINGER

ROBERT L. KING

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 16, 1970
PLANT NAME: Atomic Sewerage Plant
PLANT OWNER: Atomic Sewerage Plant
ADDRESS 6900 N.W. 58th Street, Miami, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Not applicable.
OWNER:
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 0.072 MGD YEAR COMPLETED: 1956
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED Not applicable.

OPERATION ANNUAL COST No data.
PERSONNEL Supervisor and three laborers.
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: [illegible] FEC. Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Surge tank, primary clarifier, aeration unit, secondary clarifier, three-cell lagoon.

SLUDGE TREATMENT Anaerobic digester.

DISPOSAL Recycled, then to sludge drying beds.

REMARKS

ARED BY: Robert L. King

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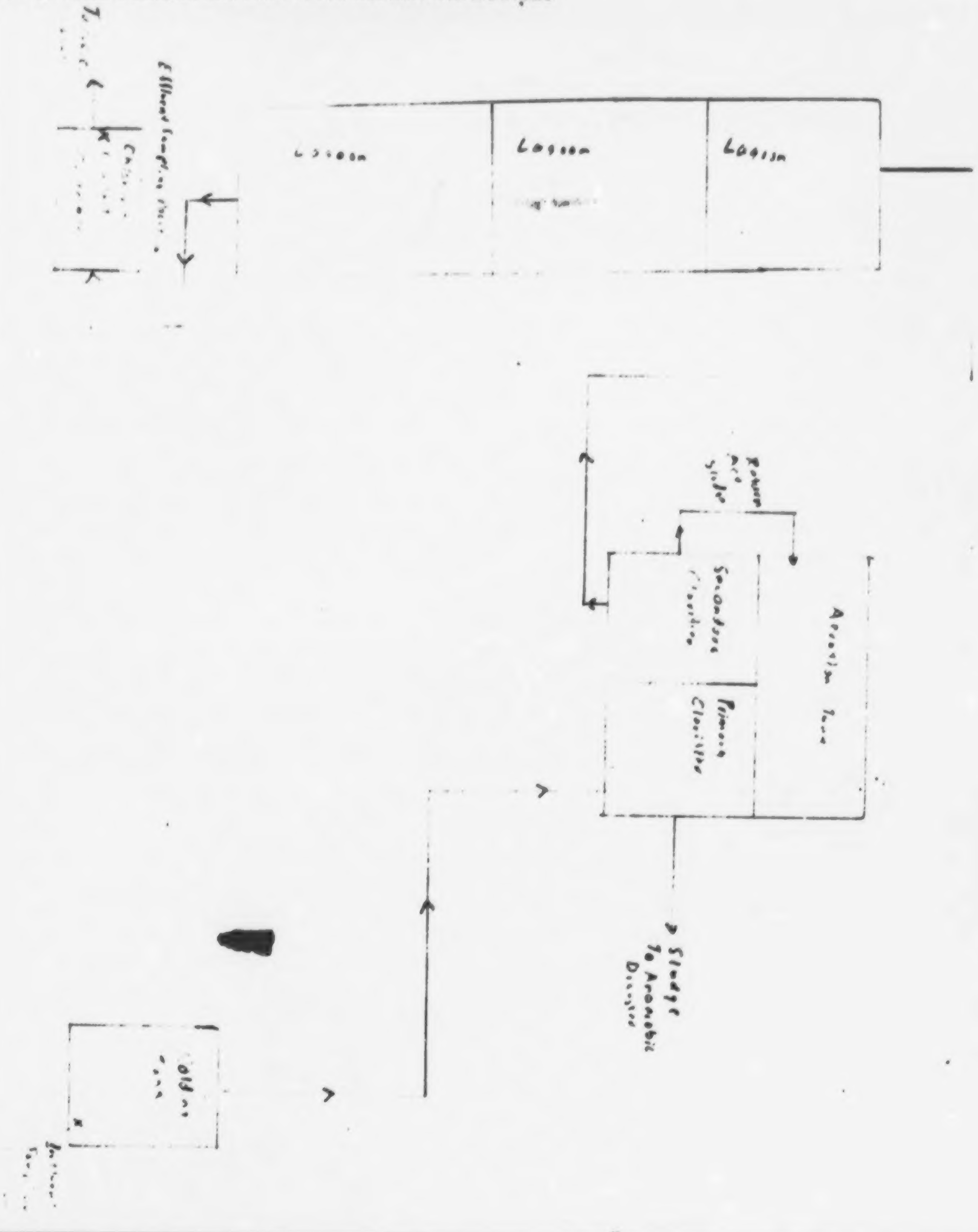
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Atomic Sewerage Plant

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Effluent Sampling Point
Lagoon
Lagoon
Lagoon
Return Act Sludge
Secondary Clarifier
Aeration Tank
Primary Clarifier
Sludge To Anaerobic Digester
Holding Tank

PREPARED BY: Robert L. King

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT - DATA SUMMARY

PLANT ATomic sludge

							AVERAGE
DATE - OFF		12/15/70	12/16/70	12/17	12/18		
FLOW - MGD		0.027	0.024	0.026	0.024		0.025
5 DAY BOD mg/l	INFLUENT	>1322	690	>1312	1178		>1126
	EFFLUENT	70	108	124	120		105.5
	IN - OUT						
	% REMOVAL	>94.7	[illegible]1.4	>90.6	89.8		>89.9
	LOAD-lbs/day	16	22	27	24		22
COD mg/l	INFLUENT	[illegible]	1,737	6,796	3,792		9179
	EFFLUENT	216	311	663	679		461.5
	IN - OUT						
	% REMOVAL	94.1	[illegible]	90.2	82.1		88.4
	LOAD -lbs/day	49	62	144	136		98
TSS mg/l	INFLUENT	166[illegible]	[illegible]	2070	1140		1348
	EFFLUENT	[illegible]	[illegible]	[illegible]	140		124.0
	IN - OUT						
	% REMOVAL	[illegible]1.7	83.9	96.7	87.7		89.0
	LOAD- lbs/day	46	17	15	28		27
VSS mg/l	INFLUENT	1411	[illegible]190	[illegible]	1020		1335
	EFFLUENT	56	[illegible]	[illegible]	116		72.5
	IN - OUT						
	% REMOVAL	95.1	87.6	97.4	88.6		92.5
	LOAD –lbs/day	15	11	12	23		15
Settlable Solids ml/l	INFLUENT	[illegible]	[illegible]	740	740		33.0
	EFFLUENT	.1	.1	.1	0.0		.08
	IN - OUT						
	% REMOVAL	99.9	98.7	99.9	100		99.6
TOC mg/l	INFLUENT	1125	360	[illegible]	[illegible]		990.0
	EFFLUENT	63	90	[illegible]	[illegible]		98.9
	IN - OUT						
	% REMOVAL	94.4%	[illegible]	[illegible]	[illegible]		87.4
	LOAD - lbs/day	14	18	24	26		21

INFLUENT BOD POPULATION EQUIVALENT = >1326

EFFLUENT BOD POPULATION EQUIVALENT = 129

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released

From The Desk Of
Michael V. Polito

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

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PLANT Atomic Sludge

DATE - OFF		12/15	12/16/70	12/17	12/18		AVERAGE or MEDIAN*
FLOW - MGD		0.027	0.024	0.026	0.024		0.024
KTELDAHL NITROGEN as N	CONC.-mg/l	12.9	21.8	19.9	21.3		19.0
	LOAD-lbs/day	3	4	4	4		4
AMMONIA NITROGEN as N	CONC.-mg/l	2.9	10.9	6.8	11.4		8.0
	LOAD-lbs/day	1	2	1	2		2
ORGANIC NITROGEN as N	CONC.-mg/l	10.0	10.9	13.1	9.9		11.0
	LOAD-lbs/day	2	2	3	2		2
NO_2 - NO_3 as N	CONC.-mg/l	0.3	0.3	0.3	0.4		.3
	LOAD-lbs/day	0	0	0	0		0
TOTAL PHOSPHORUS AS P	CONC.-mg/l	4.7	8.8	8.4	8.2		7.5
	LOAD-lbs/day	1	2	2	2		2
CHLORIDE	CONC.-mg/l	115	117	106	124		116
TOTAL COLIFORM	CONC.-MPN/100ml	<18	<18	-	<18		<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	-	<18		<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Atomic Sewage Co.

DATE ON		14 Dec 70	15 Dec 70	16 DEC 70	17 Dec 70		AVERAGE
TIME ON			1400 / 11:50	1200	1130		
DATE OFF		15 Dec 70	16 Dec 70	17 Dec	18 Dec		
TIME OFF		1400 / 11:30	1200	11.30	0800		
FLOW	START		~~27,000~~				
	END	27,000	24,000				
	TOTAL	27,000	24,000	26,000	12,000		
	24 hr. Flow Rate	27,000	24,000	26,000	≈ 24,000		25,250
INF.	TEMP. ON	25.3 °C	24.2 °C	25.0	23.5	~~25.5~~	24.5
	PH - ON	9.9	7.2	7.5	6.6	~~7.5~~	7.8
EFFLUENT	TEMP - ON	24.0 °C	23.0 °C	24.5 °C	21.0		23.1
	PH - ON	9.6	6.8	6.9	6.2		7.4
	Cl. Residual	>10.0 /Red*	[illegible] 20	>10	>10		>10
	CHLORINE-ON	–	–	–	–	–	
	CHLORINE-OFF	–	–	–	–	–	
	ON-OFF-lbs	–	–	–	–	–	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
14 Dec 70				
15 Dec 70	CLEAR / suds	NORMAL	O.K. #16 Eff/DRY	GAE
16 Dec 70	WHITE CLOUDY	NORMAL	11+12 Eff Tripped 1000 Inf → 4+15 clear 17+5 Dark 16-blank	GAG
17 Dec	White cloudy	NORMAL	16 Eff-blank	LAW
18 Dec	Normal	Normal	16+17 eff-blank	

LOWER FLORIDA ESTUARY STUDY
Report on Waterborne Wastes From
Bell Aire Subdivision Wastewater Treatment Plant
(Owned by South Dade Utilities, Incorporated)
P. O. Box 786
Miami, Dade County, Florida
March 23, 1971

INTRODUCTION

The Bell Aire Subdivision wastewater treatment plant was surveyed during the period January 24-29, 1971. The plant is a trickling filter system with microstrainer, and the effluent is split. Approximately 60 percent of the effluent flows through a sand filter and subsequently to ground water, while the remaining 40 percent flows to Canal C-100. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent before chlorination. Messrs. Laurence Walz and Joe Hopson were the sample collectors. Primary contacts were Mr. "Red" Barlow of South Dade Utilities, and Mr. Robert Cuevas of Greenleaf/Telesca, Engineers and Architects.

SUMMARY AND CONCLUSIONS

The average flow through the Bell Aire Subdivision wastewater treatment plant was 0.423 MGD, well under the design flow of 0.525 MGD. The average 5-day biochemical oxygen demand (BOD) of the influent and effluent were 233 and 51 mg/l, respectively. The influent concentration was greater than the design concentration of 145 mg/l, and the effluent did not meet the design criteria of 13 mg/l. The plant discharges an average of 180 lbs. per day BOD to the sand filters and the C-100 Canal. The average influent total suspended solids (TSS) concentration was 285 mg/l, which is significantly greater than the design TSS concentration of 140 mg/l. An average of 99 lbs. TSS was discharged at an average concentration of 28 mg/l. The effluent was effectively chlorinated on all but two days of the survey. On January 27, 1971, extremely high bacterial concentrations were evident.

This plant does not meet the criteria for removal of 90 percent BOD or suspended solids. The average BOD removal efficiency was 77.8 percent during the study and that for total suspended solids was 89.5 percent.

It is recommended that the present plans to replace the existing system with an activated sludge plant be re-initiated for completion as soon as possible.

INVENTORY

The plant is designed for a total flow of 0.525 MGD of raw sewage with a BOD of 145 mg/l and suspended solids concentrations of 140 mg/l. The calculated BOD of the plant effluent is 13 mg/l with a 98 percent suspended solids reduction.

Major components are (1) bar rack (2) 2 grit chambers (3) 1 combinator, with by-pass, designed for capacity of 3.0 MGD (4) primary clarifier with detention time of 2.07 hours (5) trickling filter with an area of 1963 square feet (6) secondary clarifier with detention time of 2.07 hours at design flow (7) chlorine contact chamber (8) microstrainer (9) sand filters, 2, with a combined design rate of filtration of 1.44 MGD.

DISCUSSION OF RESULTS

The average flow during the study period of 0.423 MGD, which is well under the 0.525 MGD design flow for this plant. The average total chlorine residual during the study period was 1.5 mg/l, but the average was reduced significantly by the fact that there was no chlorine residual on January 27, and less than 0.1 mg/l on January 28. The disinfection of the effluent was effective on the first three days of the survey, however, on the 4th day, January 28, total coliform was 9,200,000 mpn per 100 ml and fecal coliform was 1,700,000 mpn/100 ml. No samples were collected on January 29, 1971.

The pollutional strength of the discharge and the efficiency of the plant were determined by the 5-day BOD, chemical oxygen demand (COD), and the total organic carbon (TOC) tests. The average BOD of the effluent was 51 mg/l, significantly greater than the design effluent concentration of 13 mg/l, and an average of 180 lbs. per day was discharged to surface water and C-100 Canal. The average removals of COD and TOC were 71.9 and 69 percent, respectively.

The average removal of total suspended solids (TSS) was 89.5 percent, and the average concentration in the effluent was 28 mg/l, with an average total load to the stream of 99 lbs. per day. The plant was extremely efficient in removing settleable solids, since 100 percent were removed on all days of the survey. Significant quantities of nutrients are discharged by the plant, principally in the form of ammonia nitrogen, 70.4 lbs. per day and total phosphorus, 36 lbs. per day. Daily values of the data collected during the study are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

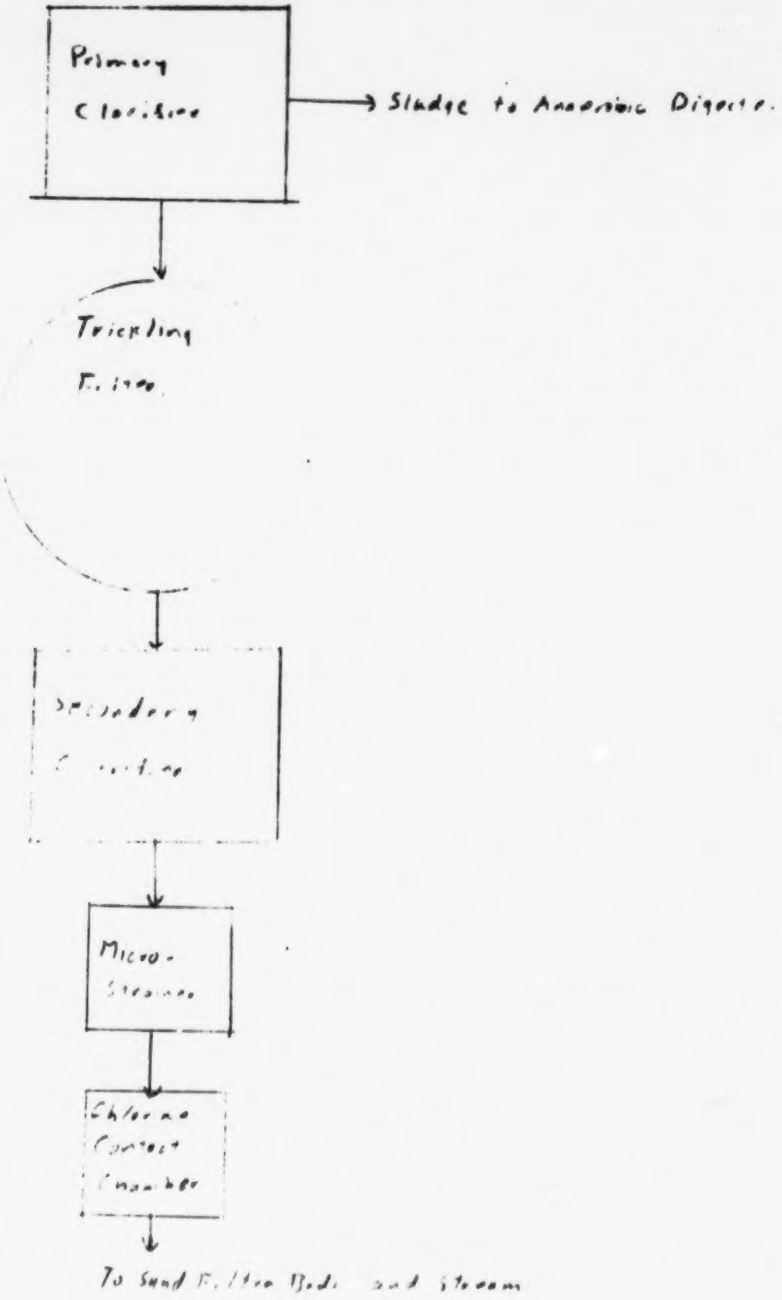
Visual appearance, "housekeeping," and mechanical maintenance of the plant is excellent. A new microstrainer (no design data provided) was installed approximately two weeks before the initiation of the survey. Operation of the microstrainer had not been completely stabilized during the survey period, causing some confusion in plant operation. The operator stated that the chlorine residual from the chlorine contact chamber was maintained at approximately 10 ppm; however, data on the first three days of the survey indicated chlorine residuals at a lower value, approximately 2.5 ppm. This discrepancy may have been caused by the difference in methods of determining chlorine residual. Generally chlorine residual is determined as a "flash" value by operators in Dade County, while procedures used during the survey measured the chlorine residual after a somewhat longer detention period. The lack of chlorine residual on the last two days of the survey was verified by both samplers involved in the program.

The operator questioned the sampling positions utilized during the survey. He felt that samples of the effluent should have been taken after chlorination, and downstream from the sand filter. Our positions were selected, based on an understanding that plant efficiency was to be evaluated prior to chlorination wherever possible. The sand filter was not evaluated, since only 60 percent of the effluent from the plant flows through the sand filters and this would not have provided data regarding the strength of the effluent flowing into Canal C-100.

The South Dade Utilities Company has plans for upgrading of treatment at the Bell Aire Subdivision plant. These plans include the installation of an activated sludge system. However, planning has been suspended, pending completion of this survey and further recommendations by the Dade County Enforcement Conference. It is recommended that this planning be re-initiated as soon as possible.

Prepared by Robert L. King

Bell Aire Subdivision


Primary Clarifier
Sludge to Anaerobic Digester
Trickling Filter
Secondary Clarifier
Micro-Strainer
Chlorine Contact Chamber
To Sand Filter Beds and Stream

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Sheet ___ of _____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 28, 1971

PLANT NAME: Bell-Aire Subdivision

PLANT OWNER: South Dade Utilities

ADDRESS 9889 S.W. 186th Street, Perrine, Florida 33157

TELEPHONE 235-7342

COLLECTION SYSTEM – TYPE: Separate

OWNER: Same

ADDRESS:

TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 525 MGD YEAR COMPLETED: 1968 + addition microstrainer January - 1971

STREAM FLOW cfs DURATION days FREQUENCY Yrs

CONSTRUCTION COST

POPULATION SERVED 4,680

OPERATION ANNUAL COST

PERSONNEL Chief Operator, two operators, two laborers.

LEVEL OF CERTIFICATION Chief Operator "C", one operator "C".

CONDITION OF EQUIPMENT Good

OUTFALL TYPE SIZE LENGTH

DISCHARGED TO: 40% of flow to C-100 (canal) 60% to groundwater WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Comminutor, primary clarifier, trickling filter, secondary clarifier, microstrainer, chlorine contact chamber, sand beds.

SLUDGE TREATMENT Aerobic digester (single stage) to sludge drying.

DISPOSAL To County dump.

REMARKS

PREPARED BY:

Sheet 130 of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Bel-Aire Subdivision

DATE - OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE
FLOW - MGD							
5 DAY B O D mg/l	INFLUENT	254	228	228	238	218	233
	EFFLUENT	63	56	47	49	42	51
	IN - OUT	191	[illegible]	[illegible]			╳
	% REMOVAL	[illegible]	[illegible]	[illegible]	79.4	80.7	77.8
	LOAD-lbs/day						
C O D mg/l	INFLUENT	811	635	559	379	[illegible]	605
	EFFLUENT	150	153	143	221	39	151
	IN - OUT						╳
	% REMOVAL	81.5	75.9	74.4	41.7	86.1	71.9
	LOAD -lbs/day						
T S S mg/l	INFLUENT	464	316	208	176	260	285
	EFFLUENT	20	44	28	16	31	28
	IN - OUT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	╳
	% REMOVAL	[illegible]			[illegible]		89.5
	LOAD- lbs/day						
V S S mg/l	INFLUENT	428	[illegible]	[illegible]	124	[illegible]	250
	EFFLUENT	16	39	22	10	[illegible]	23
	IN - OUT						╳
	% REMOVAL	96.3	85.4	88.0	91.9	88.1	94.6
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	7	12	6	8	10	86
	EFFLUENT	0	0	0	0	0.0	0.0
	IN - OUT						╳
	% REMOVAL	100	100	100	100	100	100
T O C mg/l	INFLUENT	130	175	115	100	110	126
	EFFLUENT	43	50	43	26	33	39
	IN - OUT						╳
	% REMOVAL	66.9	71.4	62.6	74.0	70.0	69.0
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released

From The Desk Of
Michael V. Polito

Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Bel Air

DATE · OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE or MEDIAN*
FLOW · MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	21.5	25.4	25.6	23.2	24.8	24.1
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	18.4	21.0	20.0	19.0	21.0	19.9
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	3.1	4.4	5.6	4.2	3.8	4.2
	LOAD-lbs/day						
NO_2 ·NO_3 as N	CONC.-mg/l	0.41	0.42	1.02	1.2	1.0	.8
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	9.8	11.8	11.0	9.8	8.8	10.2
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	37	40	40	42	40	40
TOTAL COLIFORM	CONC.-MPN/100ml	<18	<18	<18	9,200,000	230	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	1,700,000	45	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Bell-Aire Subdivision

DATE ON		1/24/71	1/25/71	1/26/71	1/27/71	1/28/71	AVERAGE
TIME ON		0730	0730	0930	0940	0940	☒
DATE OFF		1/25/71	1/26/71	1/27/71	1/28/71	1/29/71	☒
TIME OFF		0730	0730	0940	0940	0840	☒
FLOW	START X1000	355230	355746	356207	356711	357131	☒
	END	355746	356207	356711	357131	357549	☒
	TOTAL	516000	461	504,000	420,000	4180	☒
*	24 hr. Flow Rate	516000	461,000	498,960	420,000	434,720	466,136
INF.	TEMP. ON	24.5	25	24.6	24.4	23.3	24.4
	PH - ON	7.2	7.3	7.4	7.7	7.6	7.4
EFFLUENT	TEMP - ON	24.3	24.5	22.2	20.4	20.7	22.4
	PH - ON	6.6	6.5	6.4	6.8	6.8	6.6
	Cl. Residual	2.5	2.5	2.5	0	<0.1	1.5
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
1/25/71	Normal	Normal	OK	LRW
Jan 26th	Foam in eff.	Microstrainer worked on from ≈ 1400-1600	Inf - #1-7 blank due to mechanical bind.	
1/~~26~~27/71	Normal	Normal	#1, 6, 8, 16, 17 missed	LRW
1/~~28~~28/71	Normal	Normal	OK	LRW
1/29/71	Normal	Normal except No Cl_2	OK	LRW
	Flow meter not reading	correctly all figures		
	for 24 hr Flow rate by 43,200 gals.	need to be reduced		

Lower Florida Estuary Study
Report on Waterborne Wastes from
Carol City Waste Water Treatment Plant
(Owned by Carol City Utilities, Inc.)
3801 N.W. 181st Street
Carol City, Dade County, Florida
January 7, 1971

INTRODUCTION

The Carol City Waste Water Treatment Plant was surveyed during the period November 29 through December 4, 1970. The plant is an activated sludge unit with final discharge into the Carol City Canal. Serco automatic samplers were utilized to collect five 24-hour composites of the influent and effluent, before chlorination. Daily grab samples were taken after chlorination, for chlorine demand, pH, and total and fecal coliform. Messrs. Terry Davis and George Egermier collected the samples. Contacts were Mr. Ernest Colson, Chief Plant Operator, and Maurice A. Sholar of Ray L. Hart & Associates, the engineering consultant for the plant.

SUMMARY AND CONCLUSIONS

An average flow through the Carol City Waste Water Treatment Plant of 2.03 MGD was measured during the study period. The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 164 and 30.7 mg/l respectively. An average BOD_5 of 520 lbs. per day was

... 2

discharged to the Carol City Canal. The average influent total suspended solids concentration was 146 mg/l and an average loading of 955 lbs. per day was discharged at an average concentration of 56 mg/l. Most of the time the effluent was effectively chlorinated, but on November 30, 1970 extremely high bacterial concentrations were evident.

Based on the high BOD_5 removal efficiency calculated on December 1, 1970, the relatively constant influent concentration, and the large variation in daily removal efficiencies, improved operation of this plant could produce a higher quality effluent.

This plant does not meet the Dade County criteria for BOD_5 or total suspended solids, which requires an average removal efficiency of 90% with no values less than 85%. The average BOD_5 removal efficiency was 82.5% during the study and that for total suspended solids was 71.2%. The average removal efficiency was calculated from the daily removal efficiencies.

The following are recommended to improve plant operation:

1. The stabilization of operating procedure, with use of more extensive laboratory data as a basis for making changes in plant operation.

2. Modification of the outfall to eliminate foaming.

3. The installation of chlorine dosing controls to insure effective chlorination.

...3

4. Modifications in the operation of the clarifiers to increase the removal of solids or the installation of additional devices to reduce solids in the plant effluent.

INVENTORY

Specific design criterion were not available for this plant, as it was constructed in 1959 and the engineering consultant presently employed was not the designing firm. Major components are:

1. Comminutor in the basement of the laboratory-office building, which is located between the primary and secondary digesters. The influent sampling position was located upstream from the comminutor.

2. Grit chamber, which was not in operation during the first day of sampling.

3. Three-cell primary clarifier.

4. Three-cell aeration unit with four mechanical aerators in each cell. At present only three of the aerators in each cell are operated at any one time. The operators have found that this provides sufficient D.O., and reduces the problem of foaming.

5. Three-cell secondary clarifier. The present practice is to return 97% of the activated sludge to the aeration units.

6. Chlorine contact chamber, with outfall to the Carol City Canal.

7. Two stage aerobic digester with sludge disposal accomplished by hauling liquid sludge to a County dump.

... 4

DISCUSSION OF RESULTS

The average flow during the study period was 2.03 MGD, which is well under the 3.5 MGD design flow for this plant. The average total chlorine residual during the study was 4.0 mg/l and disinfection of the effluent was generally effective. However, on November 30, 1970 extremely high concentrations of total coliform, 2,400,000 MPN per 100 ml., and fecal coliform, 790,000 MPN per 100 ml., were observed.

The pollutional strength of the discharge and the efficiency of the plant were determined by the five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD) and the total organic carbon (TOC) tests. The average BOD_5 of the effluent was 30.7 mg/l and an average of 520 lbs. per day were discharged to the Carol City Canal. The removal efficiencies of BOD_5 varied from 73.5 to $>$97.3% for an average of 82.5%. Since the influent concentrations were relatively constant this variation reinforces the observation that plant operation is erratic. The average removals of COD and TOC were 78.4 and 49.1 percent respectively.

The average removal of total suspended solids (TSS) was 71.2 percent with three values in the 60% range and one at 91.5%. The average quantity of TSS in the effluent was 56 mg/l or 955 lbs. per day. The plant is extremely efficient in removing settleable solids, since on the average 99.3% were removed.

Significant quantities of nutrients are discharged by this plant, principally in the form of ammonia nitrogen, 296 lbs. per day, and total phosphorus, 154 lbs. per day.

Daily values of the data collected during the study are presented in the attached Field and Data Summary Sheets.

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DISCUSSION OF OBSERVATIONS

General appearance of the plant is fair. "Housekeeping" could be improved, and mechanical maintenance appeared to be somewhat erratic. Various maintenance projects were in progress during the survey, but there seemed to be no organization or follow-through in completion of these programs. The Chief Operator appears to be extremely conscientious, and is making an effort to improve operation of the plant. However, plant operation is erratic. There are so many changes being made that plant operation never stabilized. The grit-chamber was not in operation when the survey was begun, but was placed in operation after we questioned the operators as to why it was not operating. Pre-chlorination was being used at one time during the survey. We recommend a stabilization in operation procedure, with use of more extensive laboratory data as a basis for making changes in plant operation. The primary visual problem is that of detergent type foam at the point where chlorine is introduced and in the Carol City Canal at the effluent. The foam was extensive in the Canal. The Chief Operator stated that this has been a problem since plant operation was begun in 1959. The outfall is designed to allow free-fall of the effluent into the Canal. We recommend a modification in outfall design to reduce the problem.

ROBERT L. KING

LAWRENCE W. OLINGER

Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 3, 1970

PLANT NAME: Carol City Utilities

PLANT OWNER: Carol City Utilities

ADDRESS 15450 N.W. 27th Avenue, Opa Locka, Florida

TELEPHONE MU 5-2431

COLLECTION SYSTEM – TYPE: Separate

OWNER: Same as above.

ADDRESS:

TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 3.5 MGD YEAR COMPLETED: 1959

STREAM FLOW cfs DURATION days FREQUENCY Yrs

CONSTRUCTION COST $1.2 million

POPULATION SERVED 4,924 connections (approximately 17,000)

OPERATION ANNUAL COST

PERSONNEL Chief operator, 2 operators, lab technician, and 3 laborers.

LEVEL OF CERTIFICATION Chief operator has C; others studying for Certification.

CONDITION OF EQUIPMENT Fair

OUTFALL TYPE SIZE LENGTH

DISCHARGED TO: Carol City Canal WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Communitor, three-cell primary clarifier, three-cell aeration tank (with four mechanical agitators per cell), three-cell secondary clarifier, gas chlorination, and chlorine contact chamber.

SLUDGE TREATMENT Two stage aerobic digester.

DISPOSAL Haul liquid sludge to County Dump at 47th Avenue and 200th Street.

REMARKS Infiltration problems cause hydraulic overloading during periods of heavy precipitation. Serve the following retail establishments: 7 laundromats, 10 service stations, 9 grocery markets, and 6 restaurants.

EPARED BY:

Sheet ___of____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Carol City

DATE ON		29 Nov, 1970	30 Nov 1970	1 Dec 70	2 Dec 70	3 Dec 70	AVERAGE
TIME ON		0857	0827	0957	0746	0842	
DATE OFF		30 Nov, 1970	1 Dec 70	2 Dec 70	3 Dec 70	4 Dec 70	
TIME OFF		0800	0957	0746	0842	0807	
FLOW	START x 100	7471121	7490866	7512130	7530689	7551894	
	END x 100	7490486	7512130	7530689	7551894	7571892	
	TOTAL x 100	19365	21264	18559	21206	19998	
	24 hr. Flow Rate	2,020,696	2,001,318	2,043,193	2,035,680	2,051,077	2,030,928
INF.	TEMP. ~~ON~~ OFF	26.0	24.0	26.0	25.9	25.5	25.94
	PH - ~~ON~~ OFF	7.2	7.2	7.92	7.2	7.15	7.33
EFFLUENT	TEMP - ~~ON~~ OFF	25.1 °C	24.9 °C	25.0 °C	25.1 °C	24.7 °C	24.96
	PH - ~~ON~~ OFF	7.1	6.9	6.82	6.8	6.8 ~~7.49~~	6.88
	Cl. Residual	2.5	2.5	5.0	5.0	5.0	4.0
	CHLORINE-ON	–	–	–	–	–	
	CHLORINE-OFF	–	–	–	–	–	
	ON-OFF-lbs	–	–	–	–	–	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
29 Nov	Foam in effluent	Grit chamber being put into opr. 4 Aerators off [illegible] - 3 for 2 wks (test) 1 out completely		
30 Nov	Foam in plant + canal	Grit chamber operating 3 aerators off	Effluent #20 empty #22 9 fal Influent only #16 + 3 triggered	7 clock wound
1 Dec 70	Foam in Pl. + Canal	4 aerators down	9, 10, 11, 12, 13, 14 + 15 only samples. Replaced Clock-Effluent	
2 Dec 70	[illegible] foam in Plant. Floc Final is Turbid with [illegible]	3 AERATORS down	3 effluent not activated	
3 Dec 70	Eff. clear with Irregular shaped floc + Dispersion	3 aerators down	over	
4 Dec 70	Eff. fairly clear with widely dispersed, irregular shaped floc.	Foam in canal growing. Foam in aerators + channels. 3 Aerators down	Inf. #10 empty	

Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT — DATA SUMMARY

PLANT Carol City

DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE
FLOW - MGD		2.02	2.00	2.04	2.04	2.05	2.03
5 DAY B O D mg/l	INFLUENT	N/S	185	151	162	158	164
	EFFLUENT	45.3	< 5	40	35	28	30.7
	IN - OUT		> 180	111	127	130	
	% REMOVAL		> 97.3	73.5	78.5	82.3	82.5
	LOAD-lbs/day	763	83	681	595	479	520
C O D mg/l	INFLUENT	NO SAMPLE	505	477	555	525	516
	EFFLUENT	151	NO SAMPLE	138	121	72	121
	IN - OUT			339	434	453	
	% REMOVAL			71	78.2	86.	78.4
	LOAD -lbs/day	2,543	—	2352	2060	1234	2047
T S S mg/l	INFLUENT	N/S	[illegible]	[illegible]	142	[illegible]	146
	EFFLUENT	116	[illegible]	[illegible]	12	[illegible]	56
	IN - OUT						
	% REMOVAL		68.5	61.3	91.5	63.6	71.2
	LOAD- lbs/day	1954	917	817	209	876	955
V S S mg/l	INFLUENT	N/S	N.R.	[illegible]	132	[illegible]	106
	EFFLUENT	64	N/S	[illegible]	11	[illegible]	42
	IN - OUT			[illegible]	121	68	
	% REMOVAL			[illegible]	92	64	63.7
	LOAD –lbs/day	1078	767	854	183	651	713
Settlable Solids ml/l	INFLUENT	N/S	~~N/S~~ 13	11	15	5.0	11
	EFFLUENT	<.5	N/S	0.2	nil	0.0	0.2
	IN - OUT			10.8	15	5	
	% REMOVAL			98	100	100	99.3
T O C mg/l	INFLUENT	N/S	[illegible]	6.5	70	75	96.9
	EFFLUENT	[illegible]	N/S	50	[illegible]	30	36.8
	IN - OUT			15		45	
	% REMOVAL			23	64.4	60	49.1
	LOAD - lbs/day	590		850	542	513	624

INFLUENT BOD POPULATION EQUIVALENT =________

EFFLUENT BOD POPULATION EQUIVALENT =________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polit

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Carol City.

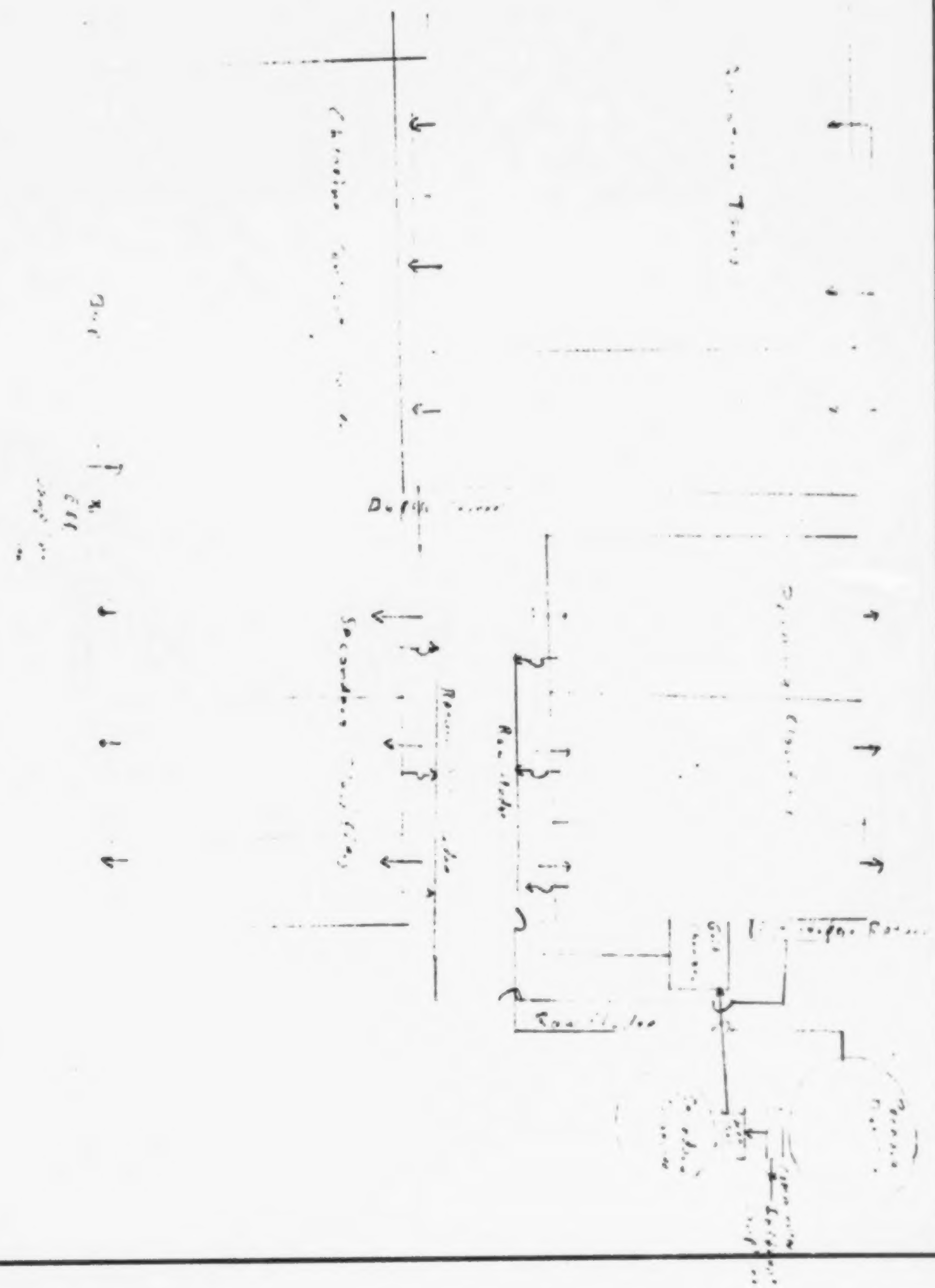
DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE or MEDIAN*
FLOW - MGD		2.02	2.00	2.04	2.04	2.05	2.03
KTELDAHL NITROGEN as N	CONC.-mg/l	24.0	N/S	21.0	21.6	20.4	21.8
	LOAD-lbs/day	406	–	357	367	349	368
AMMONIA NITROGEN as N	CONC.-mg/l	19.0	N/S	17.0	17.0	16.8	17.4
	LOAD-lbs/day	320	–	289	289	287	296
ORGANIC NITROGEN as N	CONC.-mg/l	5.0	N/S	4.0	4.6	3.6	4.3
	LOAD-lbs/day	84	–	68	79	62	73
NO_2 -NO_3 as N	CONC.-mg/l	0.2	N/S	8.2	0.1	0.1	2.2
	LOAD-lbs/day	4		139	2	3	37
TOTAL PHOSPHORUS AS P	CONC.-mg/l	10.1	N/S	10.1	7.8	8.1	9.0
	LOAD-lbs/day	170		172	133	137	154
CHLORIDE	CONC.-mg/l	35.0	–	37.0	38.0	36.0	36.5
	[illegible]	–	37.0				
TOTAL COLIFORM	CONC.-MPN/100ml	2,400,000	18-	18-	18-	18-	18-
Fecal COLIFORM	CONC.-MPN/100ml	790,000	18-	18-	18-	18-	18-

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Coral City Utilities

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES



PREPARED BY:

Lower Florida Estuary Study
Report on Waterborne Wastes from
City of Homestead Waste Water Treatment Plant
S.W. 328th Street East of U.S. 1
Homestead, Dade County, Florida
March 16, 1971

INTRODUCTION

The City of Homestead Waste Water Treatment Plant was surveyed during the period January 10 - 15, 1971. The system is composed of two plants, a trickling filter plant and a Davco activated sludge plant. Serco automatic samplers were utilized to collect samples from the influent to each of the plants, and from the common effluent after chlorination. The influent samples were composited on an equal volume basis. Grab samples of the effluent were taken daily for chlorine residual, pH, and total and fecal coliform. Messrs. Terry Davis and Joe Hopson were the sample collectors. Primary contact was Mr. W. H. Uppstrom of the City of Homestead.

SUMMARY AND CONCLUSIONS

The average flow during the study was 0.873 MGD. The average five-day biochemical demand (BOD) of the influent and effluent were 174 and 31 mg/l respectively. An average BOD of 222 lbs. per day was discharged to the C-103 Canal. The average influent total suspended solids (TSS)concentration was 258 mg/l and an average loading of 306 lbs. per day was discharged at an average concentration of 42 mg/l, at an average removal efficiency of 84.7 percent. Though the average chlorine residual was greater than 2.2 mg/l, during the survey, measurable concentrations of total coliform were present in the effluent on all five days of the survey and measurable concentrations of fecal coliform were present on four of five days of the survey.

The system does not provide 90% removal of BOD or TSS. The average BOD removal efficiency was 82.7 percent during the study and the average TSS removal was 84.7 percent. These low removal efficiencies may have been caused by incorrect allocations of flow to the two plants in the system. The average removal efficiencies were calculated from the daily removal efficiencies.

The following are recommended to improve plant operations:

1. The flow meters used for flow allocation within the system should be calibrated.

2. Flow should be allocated so that the bulk of the flow is processed through the Davco activated sludge unit.

3. As soon as practicable, the trickling filter plant should be replaced by a system capable of 90 percent removal efficiencies.

4. Existing sewer design should be modified to eliminate obstruction of lines and repeated need for clearance.

INVENTORY

The system is composed of the following:

1. "Old" plant.

The plant is designed for an average daily flow of 0.6 MGD, with a peak flow of 1.2 MGD and intake BOD concentrations of 200 - 240 ppm. Present operating procedures call for all flow in excess of 0.7 MGD to be routed through this plant. Major components are:

(a) circular primary clarifier, designed for 2.0 hours detention time at average flow;

(b) trickling filter;

(c) circular secondary clarifier, designed for 2.0 hours detention time.

2. "New" plant (Davco Aeropack System).

The plant is designed for an average flow of 0.750 MGD. The system is circular in construction with an inner compartment which functions as a secondary clarifier (detention time of 3.3 hours). The outer angular ring is composed of the following:

(a) mixing zone, with detention time of 1.53 hours;

(b) activated sludge area with detention time of 6.1 hours;

(c) chlorine contact chamber, with detention time of 30.8 minutes.

3. Digestion system.

(a) "Old" plant. An aerobic digester with sludge beds.

(b) "New" plant. Aerobic digester as a part of the package plant, with sludge disposal to sludge bed.

DISCUSSION OF RESULTS

The average flow during the study period was 0.873 MGD, well below the 1.35 MGD design flow for the combination of plants. The average total chlorine residual during the study was measured as greater than 2.2 mg/l, but disinfection of the effluent appeared to be inadequate on all days of the survey.

The pollutional strength of the discharge and the efficiency of the plant were determined by the five-day biochemical oxygen demand (BOD), chemical oxygen demand (COD), and the total organic carbon (TOC) tests. The average BOD of the effluent was 31 mg/l and an average of 222 lbs. per day were discharged to the C-103 Canal. The low removal efficiency on January 14 was caused by an obstruction in the influent line for the activated sludge unit. Subsequent clearance of the obstruction caused a surge in flow and resultant loss of the sludge blanket in the secondary clarifier. The average removals of COD and TOC were 73.5 and 56.8 percent respectively. These removal efficiencies also appeared to have been affected by the surge on January 14.

The average removal of total suspended solids (TSS) was 84.7 percent. The average quantity of TSS in the effluent was 42 mg/l or 306 lbs. per day. The plant is extremely efficient in removing settleable solids, since 99.1 percent were removed.

Significant quantities of nutrients are discharged by this plant, principally in the form of ammonia nitrogen, 82 lbs. per day and total phosphorus, 98 lbs. per day.

Daily values of the data collected during the study are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

General appearance, "housekeeping", and mechanical maintenance were good during the survey. Visual appearance of the effluent was fair except during the sampling period, January 14 - 15. During the night of January 14, the influent line for the activated sludge plant was obstructed with rags and other solid material. Upon discovery, the line was cleared and a surge of influent entered the activated sludge plant causing overflow of sludge from a secondary clarifier into the chlorine contact chamber, and subsequently into the effluent. Upon our arrival on Thursday morning, January 14, I observed this condition and the operator explained the incident. With the exception of this incident, plant operation was routine during the survey. I believe that the unchanged TSS removal efficiency on January 14, can be explained by the fact that sampling for the period January 13 - 14 was terminated at a time when the individual hourly samples were diluted.

Review of the data indicates an overall BOD efficiency lower than expected. During the plant interview, I discussed the laboratory data with the Chief Operator and we compared results taken on January 12, 1971. The concentrations for influent and effluent BOD compared favorably with data collected by the plant. In addition to these samples, the plant sampled the effluent from the trickling filter plant and from the activated sludge plant. Their data indicated that the BOD concentration from the activated sludge plant was approximately 5 mg/l, while from the trickling filter plant, the effluent BOD concentration was approximately 32 mg/l. These results were puzzling since an algebraic calculation would indicate that the BOD concentration of the combined effluent should be lower than the 24 mg/l determined by our analyses.

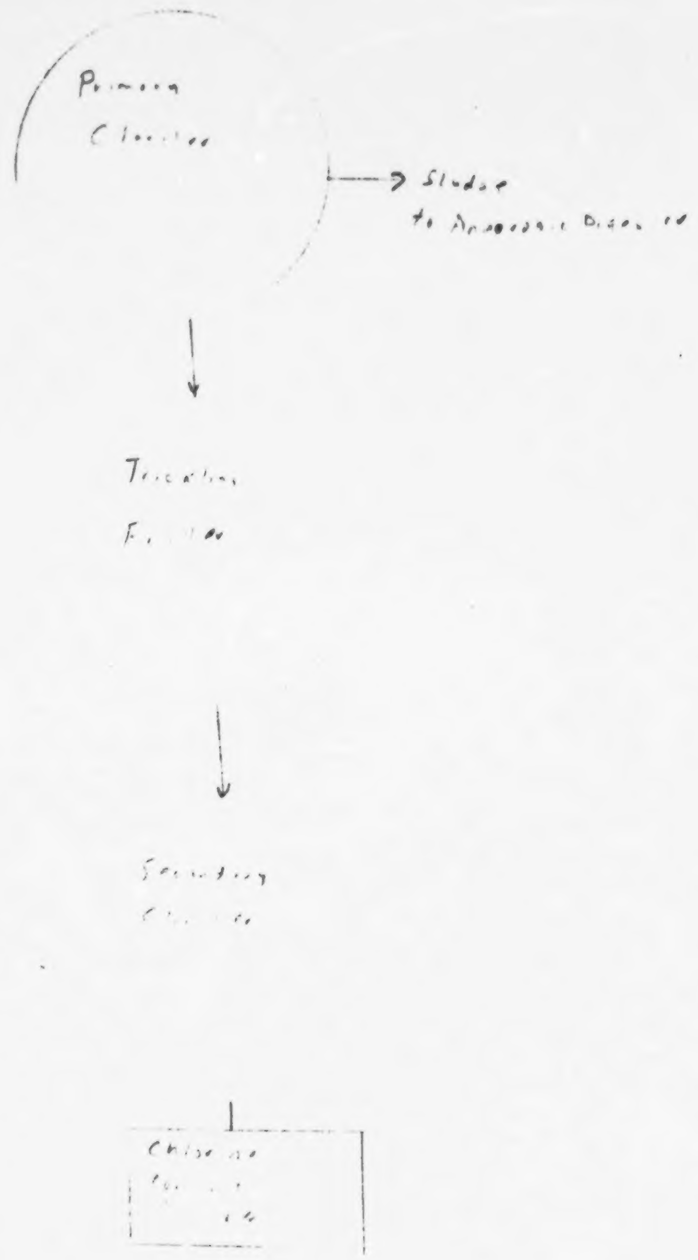
I suspected the accuracy of the flow meters, and performed a rough calibration of the flow meter for the trickling filter plant. The flow meter registered a flow of approximately 0.15 MGD, but measurement of the height of flow over the 90° weir indicated an actual flow of approximately 0.25 MGD. I could not measure the activated sludge unit, as the weir is inaccessible without a special "cat walk". The operator stated that the flow meters had last been calibrated in December 1969.

It is possible that a higher amount of flow is routed through the trickling filter than is desired. The established operating procedure is for a flow of approximately 0.700 MGD through the activated sludge unit, with the remainder of the flow through the trickling filter. If this procedure were in fact being followed, the BOD removal efficiencies should be greater. I recommend that the flow meters be calibrated properly to determine actual flow through each of the plants.

Robert L. King

City of Homestead - New Plant

City of Homestead Old Plant


Primary
Clarifier
Sludge
to Appropriate Disposal
Trickling
Filter
Secondary
Clarifier
Chlorine

Sheet 151< of

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 1971
PLANT NAME: Homestead Wastewater Treatment Plant
PLANT OWNER: City of Homestead
ADDRESS: P. O. Box 429, Homestead, Florida
TELEPHONE:
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above
ADDRESS:
TELEPHONE:

DESIGN | AVERAGE DESIGN FLOW: 1.35 MGD YEAR COMPLETED: 1954 and 1968
STREAM FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED 10,000

OPERATION | ANNUAL COST
PERSONNEL Superintendent, 3 operators, 3 assistant operators, 4 laborers.
LEVEL OF CERTIFICATION Superintendent A, Chief Operator A, 1 operator B and 1 C.
CONDITION OF EQUIPMENT Good
OUTFALL | TYPE Submerged SIZE LENGTH
DISCHARGED TO: C-103 Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT | (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Splitter box, two systems in parallel; 1.primary clarifier, trickling filter, secondary clarifier, chlorine contact tank. 2. Activated sludge plant.

SLUDGE | TREATMENT Anaerobic and aerobic digester.

DISPOSAL Drying bed.

REMARKS

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Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT City of Homestead

							AVERAGE
DATE ON		1-10-71	11 Jan, 71	12 Jan 71	13 Jan, 71	14 Jan, 71	AVERAGE
TIME ON		0915	0915	0915	0915	0915	
DATE OFF		11 Jan, 71	12 Jan 71	13 Jan, 71	14 Jan, 71	15 Jan, 71	
TIME OFF		0915	0915	0915	0915	0915	
FLOW	~~START~~ #1 x10	93806430 93826709	93826704 93847490	93847490 93866150	93885470	93910760	
	~~END~~ #2 x1,000	653658 654330	654330 655004	655004 655705	656406	656981	
	TOTAL	875,790.	881,810	887600	894,200.	827,900.	
	24 hr. Flow Rate	875,790	881,810	887600	894,200	827,900	873,460
INF.	TEMP. ON	26	26	25.4	25.8	25.6	25.8
	PH - ON	7.4	7.8	>8.2	7.~~4~~	7.6	7.7
EFFLUENT	TEMP - ON	26	27	26	24.5	26.5	25.9
	PH - ON	7.4	7.4	7.6	7.3	7.2	7.4
	Cl. Residual	>2.5	>2.5	>2.5	>1.0	2.5	>2.2
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
11 Jan, 71	Normal	Normal	Eff - 1, 8, 14, 17 19 & 23 - blank Used all of remains for composite	
12 Jan, 71	Normal	Normal	Eff - 4, 5, 6, 17 - blank 8, 10, 14, 15, 19 short - used all for composite	
13 Jan, 71	Normal	Normal	No Eff. due to clock stopping	
14 Jan, 71	Solids in Cl contact chamber on sludge plant	Approx 0230 influent line to trickle filter plant clogged up and caused overload on other plant Approx 0700 situation started to be corrected	Eff - #16 blank #6 - 150ml	
15 Jan, 71	Normal	Normal	Inf #10 blank	

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT City of Homestead

DATE - OFF		1/11	1/12	1/13	1/14	1/15	AVERAGE
FLOW - MGD		.876	.882	.888	.894	.828	.873
5 DAY B O D mg/l	INFLUENT	176	192	154	174	174	174
	EFFLUENT	24	24	N S	32	43.0	31
	IN - OUT						✕
	% REMOVAL	86.4	87.5	N.A.	81.6	75.3	82.7
	LOAD-lbs/day	175	177		239	297	222
C O D mg/l	INFLUENT	378 %	296	376	394	394	368
	EFFLUENT	98	59	NO Eff.	112	126	99
	IN - OUT						✕
	% REMOVAL	74.1	80.1	—	71.6	68.0	73.5
	LOAD -lbs/day	716	434		835	820	714
T S S mg/l	INFLUENT	344	168	164	288	328	258
	EFFLUENT	52	30	N.S	50	36	42
	IN - OUT						✕
	% REMOVAL	84.9	82.1	—	82.6	89.0	84.7
	LOAD- lbs/day	380	221		373	249	306
V S S mg/l	INFLUENT	208	154	146	232	164	181
	EFFLUENT	48	28	N.S	40	20	34
	IN - OUT						✕
	% REMOVAL	76.9	81.8	—	82.8	87.8	82.3
	LOAD –lbs/day	351	206		298	138	248
Settlable Solids ml/l	INFLUENT	8	7	7	9	7	8
	EFFLUENT	.1	0.0	N.S.	.1	.1	.1
	IN - OUT						✕
	% REMOVAL	98.8	100	—	98.9	98.6	99.1
T O C mg/l	INFLUENT	113	100	125	96	94	106
	EFFLUENT	30	22	N.S	38	80	43
	IN - OUT						✕
	% REMOVAL	73.9	78.0	—	60.4	14.9	56.8
	LOAD - lbs/day	219	162		283	552	304

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released
From The Desk Of
Michael V. Polito MP

Sheet 154< of

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT City of Homestead

DATE - OFF		1/11	1/12	1/13	1/14	1/15	AVERAGE or MEDIAN*
FLOW - MGD		.876	.882	.888	.894	.828	.873
KTELDAHL NITROGEN as N	CONC.-mg/l	13.7	11.3	N.S.	15.8	16.9	14.4
	LOAD-lbs/day	100	83		118	117	104
AMMONIA NITROGEN as N	CONC.-mg/l	11.4	8.8	N.S.	12.2	12.8	11.3
	LOAD-lbs/day	83	65		91	88	82
ORGANIC NITROGEN as N	CONC.-mg/l	2.3	2.5	N.S.	3.6	4.1	3.1
	LOAD-lbs/day	17	18		27	28	22
NO_2 -NO_3 as N	CONC.-mg/l	5.5	8.2	N.S	5.2	4.0	5.7
	LOAD-lbs/day	40	60		39	28	42
TOTAL PHOSPHORUS A S P	CONC.-mg/l	14.4	14.7	N.S.	14.0	11.1	13.6
	LOAD-lbs/day	105	108		104	77	98
CHLORIDE	CONC.-mg/l	70	79	59	78	72	72
TOTAL COLIFORM	CONC.-MPN/100ml	2400	490	230	130,000	330	490
Fecal COLIFORM	CONC.-MPN/100ml	93	<18	78	790	230	93

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
Report on Waterborne Wastes From
City of Miami Beach Ocean Outfall
73rd Street and Collins Avenue
Miami Beach, Dade County, Florida
March 22, 1971

INTRODUCTION

The City of Miami Beach Ocean Outfall pumping station was sampled during the period February 1-3, 1971. Raw sewage is pumped, untreated, through the ocean outfall. Sampling was accomplished by hourly grab samples, taken by Miami Beach city employees, and composited over a 24-hour period. Primary contacts were Messrs. Bergacher and Dansky, of the City of Miami Beach.

SUMMARY OF RESULTS AND CONCLUSIONS

Average flow for the period February 1-3, 1971, was 21.8 MGD. The average 5-day biochemical oxygen demand (BOD) of the effluent was 165 mg/l. The total BOD loading from this outfall was approximately 30,000 lbs. per day. The average total suspended solids (TSS) concentration was 176 mg/l and the average daily discharge of TSS was approximately 32,000 lbs. per day. No chlorination of the effluent is accomplished so bacteriological samples were not collected. The present lack of treatment of wastes being discharged from the Miami Beach Ocean Outfall is inconsistent with the Dade County Enforcement Conference recommendation that all discharges to the Atlantic Ocean be given secondary treatment, with at least 90 percent removal of BOD and suspended solids. It is recommended that appropriate treatment facilities be constructed as soon as possible but no later than January 1, 1974.

Daily values of the data collected during the two days of the study are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

Since no treatment is accomplished by the facility, no evaluation of treatment operations is made.

Prepared by Robert L. King

Sheet 157< of ____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Miami Beach

							AVERAGE
DATE - OFF		2/2/71	2/3				
FLOW - MGD		/	/				
5 DAY B O D mg/l	INFLUENT	158	172				165
	EFFLUENT						
	IN - OUT						╳
	% REMOVAL						
	LOAD-lbs/day						
C O D mg/l	INFLUENT	618	427				522
	EFFLUENT	N/S	N/S				
	IN - OUT						╳
	% REMOVAL						
	LOAD -lbs/day						
T S S mg/l	INFLUENT	172	180				176
	EFFLUENT						
	IN - OUT						╳
	% REMOVAL						
	LOAD- lbs/day						
V S S mg/l	INFLUENT	137	125				130
	EFFLUENT						
	IN - OUT						╳
	% REMOVAL						
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	7	8				8
	EFFLUENT						
	IN - OUT						╳
	% REMOVAL						
T O C mg/l	INFLUENT	70	70				70
	EFFLUENT	raw	raw				
	IN - OUT						╳
	% REMOVAL						
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released

From The Desk Of
Michael V. Polito

Sheet____ of 158<

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT______________________________

DATE - OFF		2/2	2/3				AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	26.3	26.5				26.4
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	17.75	20.27				19.01
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l						
	LOAD-lbs/day						
NO_2 - NO_3 as N	CONC.-mg/l	[illegible]	0.07				0.047
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	5.5	[illegible]				4.4
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	1034	924				979
TOTAL COLIFORM	CONC - MPN/100ml						
Fecal COLIFORM	CONC - MPN/100ml						

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from City of Miami - Virginia Key Waste Water Treatment Plant

Mailing Address
Mr. Garrett Sloan
Department of Water and Sewers
P.O. Box 316
Miami, Dade County, Florida
February 16, 1971

INTRODUCTION

The Virginia Key Waste Water Treatment Plant was surveyed during the period January 10 - 15, 1971. The plant is a high rate aeration unit with effluent flowing to an ocean outfall. A Serco automatic sampler was utilized to collect five 24-hour composites of the influent. Effluent samples were taken from an automatic sampler operated by the plant, after chlorination. Sample collectors were Messrs. Terry Davis and Joe Hopson. Primary contact was Mr. David Backmeyer, Plant Superintendent, Virginia Key Plant.

SUMMARY AND CONCLUSIONS

The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 311 and 64 mg/l respectively and an average 21,640 lbs. per day were discharged to the Atlantic Ocean through an ocean outfall. An average total suspended solids (TSS) influent concentration of 654 mg/l was found during the study and 24,450 lbs. per day were discharged at a concentration of 75 mg/l. The average flow during the study was 40.3 MGD which is 86% of the design flow.

The average chlorine residual concentration was 0.4 mg/l and the median total and fecal coliform concentrations measured prior to the ocean outfall and just after chlorination were 1300 and 78 MPN per 100 ml respectively.

At the present time there are no specific performance criteria for plants discharging through ocean outfalls. However, Dade County has set requirements which will come into effect on January 1, 1972. These criteria require not less than 30% removal of BOD_5 and not less than 35% removal of total suspended solids. This plant affected 79.3% removal of BOD_5 and 88.4% removal of total suspended solids. Therefore, it complies with the above requirements.

The average removal efficiencies and loadings were calculated from the daily values.

INVENTORY

The plant is designed for an average flow of 47 MGD. Major components of the plant are:

1. Aerated grit chamber. Two chambers designed for a detention time of 2.61 minutes at a flow of 76.5 MGD (assuming use of both). Normally, only one chamber is in operation, and there is semi-annual rotation.

2. Aeration tanks. The four tanks are designed to maintain a detention time of 2.75 hours. These are high rate activated sludge units with step aeration. Blowers are powered by digester gas and have a total capacity of 41,000 CFM.

3. Secondary clarifiers. There are four secondary clarifiers designed for a detention time of 2.5 hours.

4. Chlorine dosing chamber. The chlorine dosing chamber is designed for a dosage rate of 10 ppm.

5. Digester system.

   a) Two sludge thickening chambers (standard circular clarifiers) operating in parallel.

   b) Four anerobic digesters, operating in sets of two (i.e., two-stage anerobic digestion).

6. Ocean outfall. A 90" ocean outfall about 4600 feet long which discharges through 12 outlets at a water depth of 19 - 20 feet.

DISCUSSION OF RESULTS

The average flow at the Virginia Key Waste Water Treatment Plant was 40.3 MGD and the average design flow for this plant is 47 MGD.

The average BOD_5 concentration in the influent was 311 mg/l and an average 21,640 lbs. per day are discharged to the Atlantic Ocean at a concentration of 64 mg/l. Removal efficiency ranged from 71 to 86.8% and averaged 79.3% during the study period. The average influent BOD_5 concentration was more than double the basic design concentration of 143 mg/l. In spite of this the plant still affects the design removal efficiency. The average removal efficiency of chemical oxygen demand was 77.9% and an average of 57,580 lbs. per day were discharged. In addition, the average total organic carbon removal efficiency and load discharged were 73.4% and 16,720 lbs. per day respectively.

The average influent and effluent TSS concentrations were 654 and 75 mg/l respectively, and the average influent concentration was in excess of four times the basic design concentration of 160 mg/l. In this case, higher than design removal efficiencies were accomplished. The average quantity of volatile suspended solids discharged was 19,700 lbs. per day and an average of 4,750 lbs. per day of fixed solids were discharged. An average settleable solids removal efficiency of 99.1% was observed during the study.

Most of the nitrogen discharged was in the form of ammonia nitrogen at 14.1 mg/l or 4,744 lbs. per day. In addition, 1,716 lbs. per day of organic nitrogen was discharged at a concentration of 5.1 mg/l. Only 20 lbs. per day of nitrite-nitrate nitrogen was discharged at a concentration of 0.06 mg/l, but a large amount of total phosphate was discharged, 2,890 lbs. per day at a concentration of 8.6 mg/l.

The chlorine residual during this study ranged from 0 to 1.5 mg/l and averaged <0.4 mg/l. The bacterial concentrations in the effluent just after chlorination reflected the variable chlorination practices and were inversely proportional to the chlorine residual. The total coliform concentrations ranged from 79,000 to <18 MPN per 100 ml and the median concentration was 1,300 MPN per 100 ml. The median fecal coliform concentration was 78 MPN per 100 ml while the values ranged from 49,000 to <18 MPN per 100 ml.

The average chloride concentration measured in this waste was 1,048 mg/l, indicating a considerably higher than normal amount of infiltration into the sewerage system.

The daily values for all parameters evaluated during the study are presented in the attached Field and Data Summary Sheets.

DISCUSSION

General appearance of the plant is excellent. "Housekeeping" and mechanical maintenance were excellent during the study period. The appearance of the plant effluent prior to the outfall was fair. The plant is designed to affect 75% BOD_5 and suspended solids removal.

No special operating problems were encountered during the survey, and all equipment was operating routinely. The plant does have some rather unique operational problems. Some of these problems are as follows:

1. The size of the area served by the plant eliminates a diurnal variation in flow. However, there is a seasonal variation. During the dry season, and heavy tourist influx, flow is relatively low but there is a heavy BOD_5 loading. During the rainy season, flow is increased significantly, because of infiltration, and there is a drop in BOD_5 concentration.

2. The plant experiences no particular difficulty in handling of industrial wastes. There is a brewery which discharges to the sewer system, and numerous plating operations located in the Miami area also use the system. These plating operations discharge heavy metals into the system, but there is a heavy sulfide concentration in the sewage, which is due in part to the age of the influent. The sulfides apparently break the heavy metals into non-toxic compounds. Concentrations of

hydrogen-sulfide in the incoming sewage range from 150 - 200 grains. The incoming sewage appears black and septic, with a strong sulfide odor.

3. The sewer system experiences infiltration problems. An investigation of the sewer lines has indicated that the primary problem occurs in the Bay Shore area of Miami.

4. Because of the high sulfide content in the incoming sewage, an unusual amount of maintenance is required. The sulfide causes corrosion of metal compoents in operating equipment. In the past there has been a problem of heavy corrosion of copper coated screens and windows in the buildings causing unusually large replacement and extra expense in maintenance of building and grounds.

LAWRENCE W. OLINGER

ROBERT L. KING

Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 14, 1971
PLANT NAME: Virginia Key Waste Water Treatment Plant
PLANT OWNER: City of Miami
ADDRESS
TELEPHONE 361-5497
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above
ADDRESS:
TELEPHONE 361-5497

DESIGN AVERAGE DESIGN FLOW: 47 MGD YEAR COMPLETED: 1964
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST $11.7 million
POPULATION SERVED 500,000 (calculated value based on BOD_5 and suspended solids)

OPERATION ANNUAL COST $1,298,000 for Fiscal Year 1970
PERSONNEL 91
LEVEL OF CERTIFICATION
CONDITION OF EQUIPMENT Excellent

OUTFALL TYPE Ocean SIZE 90" LENGTH 4,600 feet
DISCHARGED TO: Atlantic Ocean WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Aerated grit chamber, aeration tanks, secondary clarifiers, chlorine dosing chamber

SLUDGE TREATMENT Sludge thickening chambers, anerobic digestors, sludge drying lagoons.
DISPOSAL

REMARKS

ARED BY: Robert L. King

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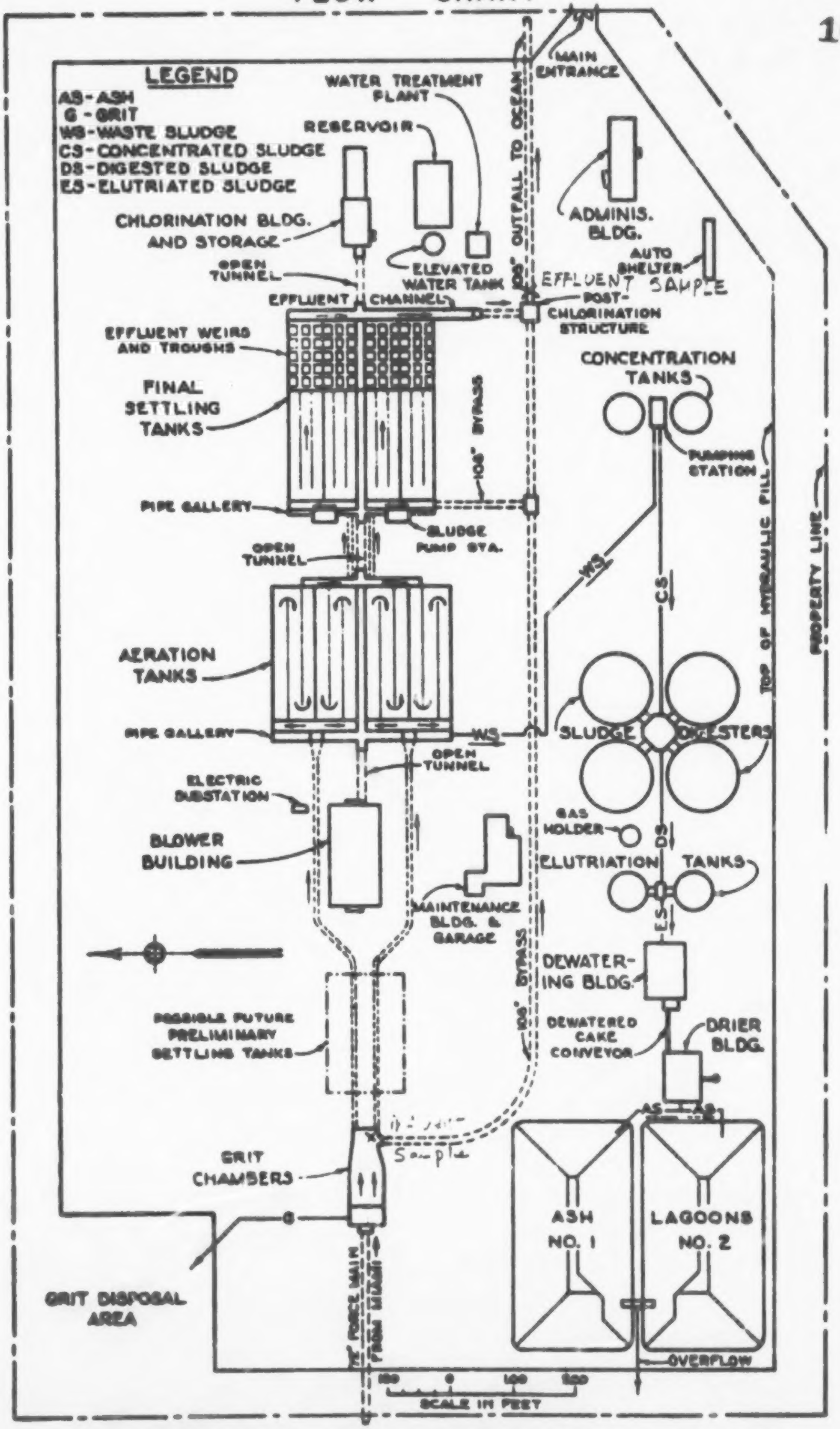
FLOW CHART


LEGEND
AS-ASH
G-GRIT
WS-WASTE SLUDGE
CS-CONCENTRATED SLUDGE
DS-DIGESTED SLUDGE
ES-ELUTRIATED SLUDGE
WATER TREATMENT PLANT
RESERVOIR
MAIN ENTRANCE
OUTFALL TO OCEAN
ADMINIS. BLDG.
CHLORINATION BLDG. AND STORAGE
ELEVATED WATER TANK
AUTO SHELTER
OPEN TUNNEL
EFFLUENT CHANNEL
EFFLUENT SAMPLE
POST-CHLORINATION STRUCTURE
EFFLUENT WEIRS AND TROUGHS
FINAL SETTLING TANKS
108" BYPASS
CONCENTRATION TANKS
PUMPING STATION
PIPE GALLERY
SLUDGE PUMP STA.
OPEN TUNNEL
WS
CS
TOP OF HYDRAULIC FILL
PROPERTY LINE
AERATION TANKS
PIPE GALLERY
WS
SLUDGE DIGESTERS
OPEN TUNNEL
ELECTRIC SUBSTATION
GAS HOLDER
DS
BLOWER BUILDING
ELUTRIATION TANKS
MAINTENANCE BLDG. & GARAGE
ES
108" BYPASS
DEWATERING BLDG.
POSSIBLE FUTURE PRELIMINARY SETTLING TANKS
DEWATERED CAKE CONVEYOR
DRIER BLDG.
Influent Sample
AS
AS
GRIT CHAMBERS
G
ASH NO. 1
LAGOONS NO. 2
GRIT DISPOSAL AREA
72" FORCE MAIN FROM MIAMI
OVERFLOW
100 0 100 200
SCALE IN FEET

CITY OF MIAMI SEWAGE TREATMENT PLANT
MIAMI, FLORIDA

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Sheet 3 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT City Miami - Virginia Key

DATE - OFF		1/11/71	1/12	1/13	1/14	1/15	AVERAGE
FLOW - MGD		37.5	42.0	40.5	40.0	41.6	40.3
5 DAY BOD mg/l	INFLUENT	250	365	310	283	347	311
	EFFLUENT	36	48	73	82	81	64
	IN - OUT						☒
	% REMOVAL	85.6	86.8	76.5	71.0	76.7	79.3
	LOAD-lbs/day	11260.	16510.	24660.	27360.	29100.	21640
COD mg/l	INFLUENT	907	632	949	642	827	791
	EFFLUENT	189	134	182	181	173	17[illegible]
	IN - OUT						☒
	% REMOVAL	[illegible]	78.8	80.8	71.8	79.1	77.[illegible]
	LOAD -lbs/day	[illegible]9110.	46940.	61470.	60380.	60[illegible]0.	57590
TSS mg/l	INFLUENT	[illegible]	616	[illegible]18	348	248	654
	EFFLUENT	150		[illegible]	60	62	75
	IN - OUT						☒
	% REMOVAL	778	94.[illegible]	94.4	82.8	92.9	[illegible].4
	LOAD- lbs/day	[illegible]	12260	12160.	20020.	21510.	24450
VSS mg/l	INFLUENT	[illegible]	[illegible]	[illegible]	320	[illegible]	580
	EFFLUENT	[illegible]	[illegible]	2	46	[illegible]	61
	IN - OUT						☒
	% REMOVAL	77.0	94.7	984	85.6	93.4	89.8
	LOAD –lbs/day	55040.	10160.	3377.	15350.	14570.	19700.
Settlable Solids ml/l	INFLUENT	[illegible]		8	8	[illegible]	9.8
	EFFLUENT	.	[illegible]	0.0	.1	[illegible]	.1
	IN - OUT						☒
	% REMOVAL	[illegible]	97.5	100	98.8	100	[illegible]
TOC mg/l	INFLUENT	[illegible]	215	[illegible]	240	[illegible]	231
	EFFLUENT	41	[illegible]	[illegible]	52	61	50
	IN - OUT						☒
	% REMOVAL	76.6	[illegible]	73.[illegible]	78.3	[illegible]	[illegible]
	LOAD - lbs/day	12820.	15060.	17230.	17350.	21160.	16720.

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released
From The Desk Of
Michael V. Polito

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Sheet 4 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT City Miami - Virginia Key

DATE - OFF		1/11	1/12	1/13	1/14	1/15	AVERAGE or MEDIAN*
FLOW - MGD		37.5	42.0	40.5	40.0	41.6	
KTELDAHL NITROGEN as N	CONC.-mg/l	16.4	18.5	20.0	18 6	21.3	19.0
	LOAD-lbs/day	5129.	6480.	6755.	6205	7390	6392
AMMONIA NITROGEN as N	CONC.-mg/l	13.2	16.0	13.8	13.6	13.8	14.1
	LOAD-lbs/day	4128	5604.	4661.	4537	4788	4744
ORGANIC NITROGEN as N	CONC.-mg/l	3.2	2.5	7 2	5.0	7.5	5.1
	LOAD-lbs/day	1001	876.	2432	1668.	2602.	1716
NO_2 - NO_3 as N	CONC.-mg/l	0.05	0 04	0.1	0.06	0.05	.06
	LOAD-lbs/day	16	14.	34	20.	17.	20.
TOTAL PHOSPHORUS AS P	CONC.-mg/l	8.6	8.9	9.4	8.8	7.3	8.6
	LOAD-lbs/day	2690	3117.	3175.	2936	2533	2890
CHLORIDE	CONC.-mg/l	1038	1010	1010	1102	1081	1048
TOTAL COLIFORM	CONC. - MPN/100ml	<18	1300	220	2400	72,000	1300
Fecal COLIFORM	CONC. - MPN/100ml	<18	78	40	470	19,000	78

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet 5 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT City of Miami

DATE ON		10 Jan. 71	11 Jan. 71	12 Jan. 71	13 Jan. 71	14 Jan. 71	AVERAGE
TIME ON		0001 (1200)	0001 (1400)	0001 (1300)	0001 (1300)	0001 (1300)	
DATE OFF		11 Jan. 71	12 Jan. 71	13 Jan. 71	14 Jan. 71	15 Jan 71	
TIME OFF		0001 (1000)	0001 (1300)	0001 (1300)	0001 (1300)	0001 (1215)	
FLOW	START						
	END						
	TOTAL						
	24 hr. Flow Rate mgd	37.50	42.00	40.50	40.00	41.60	40.3
INF.	TEMP. ON	29°	28	27.6	27.4	27.8	28.0
	PH - ON	6.8	7.0	7.0	6.5	6.5	6.8
EFFLUENT	TEMP - ON	29	28	27.5	27.8	28	28.3
	PH - ON	7.2	7.0	7.0	6.4	6.6	6.8
	Cl. Residual	1.5	<0.1	<0.1	<0.1	0	<.4
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
11 Jan, 71	Foam in effluent	Normal	OK.	
12 Jan, 71	" " "	"	OK.	
13 Jan, 71	" "	"	OK	
14 Jan, 71	" " "	"	OK	
15 Jan, 71	" " "	"	OK	

LOWER FLORIDA ESTUARY STUDY
Report on Waterborne Wastes From
City of North Miami Ocean Outfall
776 N. E. 125th Street
North Miami, Dade County, Florida.
March 22, 1971

INTRODUCTION

The North Miami Ocean Outfall was sampled on February 1-2, 1971. Single grab samples were taken daily as the effluent flows through a force main sewer line as there was no location where composite samplers could operate. The grab samples were collected from a manhole upstream from the entry of effluent from the Sunny Isles pumping station. The effluent from the Sunny Isles pumping station was collected and analyzed as a separate sample, and will be reported separately. Messrs. Laurence Walz and Terry Davis were sample collectors. Primary contact was Mr. Douglas L. Smith, Director of Water and Sewers, City of North Miami.

SUMMARY OF RESULTS AND CONCLUSIONS

No precise flow could be measured because of the number of contributors. However, Mr. Smith estimated that the total flow was 15 MGD. Approximately 1.5 MGD is contributed by the Sunny Isles Pumping Station, which was downstream from the sampling location, and was sampled separately. The average 5-day biochemical oxygen demand (BOD) of the effluent was 64 mg/l. The total BOD loading from this outfall, including the contribution from Sunny Isles, was approximately 9,000 lbs./day. The average total suspended solids (TSS) concentration was 115 mg/l and the total average daily discharge of TSS was 14,118 lbs./day. No chlorination of the effluent is accomplished so bacteriological samples were not collected. The present method of treatment of wastes being discharged from the North Miami outfall is inconsistent with the Dade County Enforcement Conference recommendation that all discharges to the Atlantic Ocean be given secondary treatment, with at least 90 percent removal of BOD and suspended solids. It is recommended that appropriate treatment facilities be constructed as soon as possible but no later than January 1, 1974.

Daily values of the data collected during the two days of the study are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

Due to the diverse sources of contributors to this outfall, specific data were difficult to obtain. Mr. Smith provided the following approximate magnitudes of flow:

Name of Contributor	Approximate Flow
Eastern Shores Subdivision	0.2 MGD
City of Hialeah	0.3 MGD
City of Opa Locka	1.5 MGD
City of North Miami	8.5 MGD
Snake Creek	3.2 MGD

Mr. Smith stated that these contributors are required to effect "preliminary" treatment of their effluent. Preliminary treatment consists of skimming floatable solids from the effluent by allowing the waste water to flow through a primary clarifier, where skimmings are discharged and the settled sludge re-combined with the supernatent and this combined unchlorinated material pumped to the ocean outfall line. This treatment is inconsistent with the Dade County Enforcement Conference recommendation that all effluent to the Atlantic Ocean be given secondary treatment, with at least 90 percent removal of BOD and year-round chlorination of the effluent.

Prepared by Robert L. King, EPA

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT North Miami

DATE - OFF		2-1-71	2-2-71				AVERAGE
FLOW - MGD							
5 DAY BOD mg/l	INFLUENT	54	73				64
	EFFLUENT						
	IN - OUT						
	% REMOVAL						
	LOAD-lbs/day						
COD mg/l	INFLUENT	577	502				540
	EFFLUENT	No Eff	N/E				
	IN - OUT						
	% REMOVAL						
	LOAD -lbs/day						
TSS mg/l	INFLUENT	76	152				115
	EFFLUENT						
	IN - OUT						
	% REMOVAL						
	LOAD- lbs/day						
VSS mg/l	INFLUENT	60	132				96
	EFFLUENT						
	IN - OUT						
	% REMOVAL						
	LOAD - lbs/day						
Settleable Solids ml/l	INFLUENT	1.5	1.5				1.5
	EFFLUENT						
	IN - OUT						
	% REMOVAL						
TOC mg/l	INFLUENT		29				42
	EFFLUENT						
	IN - OUT	raw	raw				
	% REMOVAL						
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released mp

From The Desk Of
Michael V. Polito

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT North . Miami

DATE - OFF		2-1-71	2/2				AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	11.6	13.8				12.7
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	7.84	5.15				6.50
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l						
	LOAD-lbs/day						
$NO_2 \cdot NO_3$ as N	CONC.-mg/l	0.015	0.011				0.013
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	4.0	5.3				4.6
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	726	748				737
TOTAL COLIFORM	CONC.-MPN/100ml						
Fecal COLIFORM	CONC.-MPN/100ml						

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT North Miami

							AVERAGE
DATE ON		2/1/71	2/4/71				
TIME ON		0942	0915				
DATE OFF		Grab	Grab				
TIME OFF		Sample	sample				
FLOW	START						
	END						
	TOTAL						
	24 hr. Flow Rate						
INF.	TEMP. ON						
	PH - ON						
EFFLUENT	TEMP - ON						
	PH - ON						
	Cl. Residual						
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY

Lower Florida Estuary Study
Report on Waterborne Wastes from
Community Utilities Waste Water Treatment Plant
(Owned by General Waterworks Corporation)
1826 Ponce de Leon Boulevard
Coral Gables, Dade County, Florida
January 15, 1971

INTRODUCTION

The Community Utilities Waste Water Treatment Plant, located at 7811 S. W. 23rd Street in Coral Gables, was surveyed during the periods December 8 - 11, 1970 and December 13 - 15, 1970. The total facility is composed of two activated sludge plants in parallel, with final effluent flowing into a feeder canal and subsequently to the Coral Gables Waterway. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent after chlorination. Daily grab samples of effluent were taken for chlorine demand, pH, and total and fecal coliform. Messrs. Terry Davis and George Egermier were sample collectors. Contacts were Mr. Dean Gable and Mr. A. E. Legall of General Waterworks Corporation.

SUMMARY AND CONCLUSIONS

The average flow during the study was 2.471 MGD. The plant is hydraulically overloaded since it receives 121% of its designed flow. The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 211 and 12 mg/l, respectively. The average total suspended solids (TSS) concentrations found were 200 mg/l in the influent and 24 mg/l in the effluent. The average chlorine residual in the effluent of this plant was 2.1 mg/l and the effluent was effectively disinfected.

The Dade County performance criteria require average BOD_5 and TSS concentration of 90% with no values less than 85%. This criteria was met for BOD_5 with an average removal of 94.4% and a minimum value of 91.1%. The criteria was not met for TSS, since the average concentration was 87.5%. The average values were calculated from the daily values.

It is recommended that the feeder canal receiving the effluent of this treatment plant be modified to allow proper flushing of the canal.

INVENTORY

The influent is pumped into a splitter box, from which flow is split to the two plants. Specific details of each plant are as follows:

1. Plant Number 1

   a. Comminutor.

   b. Two primary clarifiers in parallel. Raw sludge is pumped to the digester. The effluent is combined, to be split prior to entry into the activated sludge units.

   c. Two parallel three-cell activated sludge units with mechanical aeration.

   d. Flow from the activated sludge units is combined and then split again and flows through two secondary clarifiers in parallel. In the present operating mode, all activated sludge is returned from the secondary clarifiers to the aerators.

   e. Effluent from the activated sludge units is combined and flows through two chlorine contact chambers in series. No information is available on the capacity of these chambers.

f. There are no by-pass lines in this plant.

2. Plant Number 2

The influent from the splitter box flows to a comminutor, and then is again split to two primary tanks operating in parallel. From the primary clarifiers, flow is combined then re-split to flow through two activated sludge units operating in parallel. These units each have two mechanical aerators. Flow from these units is combined and re-split to flow through two secondary clarifiers operating in parallel. Sludge from the secondary clarifier is generally returned to the aeration units, but can be wholly or partially returned to the influent box for subsequent flow into the primary clarifiers. The effluent from the secondary clarifiers flows into a chlorine contact chamber, and is subsequently combined with effluent from Plant Number 1. The combined effluent is discharged into a feeder canal immediately adjacent to the Palmetto Expressway. This canal flows into the Coral Gables Waterway. The only by-pass in Plant Number 2 is one which allows by-pass of the chlorine contact chamber.

3. Digestion

There is a two stage anaerobic digester on site. However, at this time, the digesters are not in use, but are being used as a holding tank. The sludge is hauled by truck to the Virginia Key plant.

DISCUSSION OF RESULTS

The average flow at the Community Utilities Waste Water Treatment Plant was 2.471 MGD during the survey and the design flow is 2.05 MGD. The flow meter on Plant Number 2 was inoperable and flow was measured every two hours, by a plant operator, at the effluent weir of the chlorine contact chamber.

The pollutional strength of the waste was measured utilizing the five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), and total organic carbon (TOC) tests. The average BOD_5 of the influent and effluent were 211 and 12 mg/l, respectively. The average BOD_5 removal efficiency of this plant was 94.4% and an average of 230 lbs. per day of BOD_5 was discharged. The average removal efficiencies of COD and TOC were 92.9 and 89.7%, respectively.

The influent and effluent total suspended solids concentrations averaged 200 and 24 mg/l, respectively, and the average removal efficiency was 87.5%. This plant discharges 420 lbs. per day of volatile suspended solids and 79 pounds per day of fixed suspended solids. Settleable solids removal was 100%.

Nutrients discharged by this plant were principally in the form of ammonia nitrogen, 300 lbs. per day, and total phosphorus, 149 lbs. per day. Ninety lbs. per day of nitrite-nitrate nitrogen were also discharged.

The average chlorine residual in the effluent of this plant was 2.1 mg/l and the median total and fecal coliform concentrations both were <18 MPN per 100 ml. A high total coliform concentration of 230 MPN per 100 ml occurred in the effluent on December 15, 1970.

The daily values for all parameters are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

The general visual appearance of the plant is poor. "Housekeeping" and maintenance is conducted strictly on an expediency basis. These conditions exist because the plant is supposed to be closed in August of 1971. In spite of the condition of the plant, the appearance of the effluent is as good as any observed over the entire program. The plant has a history of complaints of odor problems. Residences, built since the plant was put in operation, are so close to the plant that these complaints are not surprising. The plant also has a problem of hydraulic overloading at peak flow. During one visit there, flow was so great that the water level was above the skimmers in the primary tanks of Plant Number 1. This condition at times causes sewers to back up drastically. Another problem is the condition of the feeder canal. Mr. Gable informed us that a profile had been made of the bottom of the canal, and it was found that the low point in the bottom of the canal was 13 feet below water level, while the depth at the mouth of the canal was 5 feet. This condition would preclude proper flushing of the canal, causing it to act as a quasi-settling lagoon, explaining in part the degree of entrophication. In spite of these problems, the supervisor of this plant should be highly commended for operation of the plant under extremely adverse conditions.

LAWRENCE W. OLINGER

ROBERT L. KING

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Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT COMMUNITY UTILITIES

DATE ON		8 DEC 70	9 DEC 70	10 DEC 70	13 DEC 70	14 DEC 70	AVERAGE
TIME ON		1430	0846	0824	0950	1202	
DATE OFF		9 DEC 70	10 DEC 70	11 DEC 70	14 DEC 70	15 DEC 70	
TIME OFF		0846	0824	0829	1202	1044	
FLOW	START	[illegible]	838504	840481	845935	848296	
	END	838504	840481	842311	848296	[illegible]	
	TOTAL ×1000	1,368,000 419,000	1,977,000 515,000	1,830,000 563,000	2,361,000 405,000	1,999,000 416,000	
	24 hr. Flow Rate	2,348,000	2,531,000	2,388,000	2,534,000	2,553,000	2,471,000
INF.	TEMP. ON	25.0°C	25.2°C	25.3°C	[illegible]	[illegible]	[illegible]
	PH - ON	7.0	–	–	–	–	–
EFFLUENT	TEMP - ON	24.75°C	25.0°C	25.1°C	[illegible]	25.5°C	[illegible]
	PH - ON	7.1	–	6.4	–	–	–
	Cl. Residual	[illegible]	2.5	[illegible]	[illegible]	[illegible]	[illegible]
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY

VOID SHEET

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Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Community Utilities

DATE ON		12/8	9 Dec 70	10 Dec 70	11 Dec 70	13 Dec 70	14 Dec 70 AVERAGE
TIME ON		14:30	0846	0824	0829	0930	~~1004~~
DATE OFF		9 Dec 70	10 Dec 70	11 Dec 70	~~13 Dec 70~~	14 Dec 70	~~15 Dec 70~~
TIME OFF		0846	0824	0829	~~0950~~	1202	~~1044~~
FLOW	START	837136/7.1	838504	840481	~~845935~~	845935	~~850295~~
	END	838504	840481	842311		848296	
	TOTAL x100	1368	1977	1830		2361	
	24 hr. Flow Rate	598,410	716,051	745,240			
INF.	TEMP. ON	25.0 °C	25.2°C	25.3°C		25.1°C	25.6°C
	PH - ON	7.0	–	9.8		10.2	9.7
EFFLUENT	TEMP - ON	24.75 °C	25.0°C	25.1 °C	~~25.4°C~~	25.4°C	25.5°C
	PH - ON	7.1	--	6.4	~~10.1~~	10.1	9.8
	Cl. Residual	3 est	2.5	2.0 est		1.0	2.0
	CHLORINE-ON	-	-	-	-	-	—
	CHLORINE-OFF	-	-	-	-	-	—
	ON-OFF-lbs	-	-	-	-	-	—

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
12/8	Normal	recirculating pump being repaired		~~GAE~~
9 Dec 70	Clear w/white sds, some [illegible] seen at manhole	NORMAL		GAE
10 Dec 70			OVER.	GAE
11 Dec 70	Normal	NORMAL	OVER	GAE
13 Dec 70	NORMAL	NORMAL	OK	—
14 Dec			Effluent #222 empty Influent #386 empty	CHC (OVER) →
15 Dec			#2222 Eff. no sample oil inf heavy	(OVER)

3 - GET flow Data fr Offic

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Community Gardens Utility

DATE - OFF		12/9	12/10	12/11	12/15	12/14	AVERAGE
FLOW - MGD		2.348	2.531	2.388	2.553	2.534	2.471
5 DAY BOD mg/l	INFLUENT	154.1	175.3	183	327	215	210.9
	EFFLUENT	13.4	10.1	9.5	15.5	7.1	[illegible]
	IN - OUT			173.5			╳
	% REMOVAL	[illegible]	94.2	94.8	95.3	96.7	[illegible]
	LOAD-lbs/day	262	213	189	330	150	230
C O D mg/l	INFLUENT	656	602	514	560	970	[illegible]
	EFFLUENT	44	41	41	48	53	[illegible]
	IN - OUT	612	561				╳
	% REMOVAL	93.3	93.2	92.	91.4	94.5	[illegible]
	LOAD -lbs/day	862	865	817	1022	1120	937
T S S mg/l	INFLUENT	176	[illegible]	[illegible]	216	240	200
	EFFLUENT	30	15	[illegible]	33	10	[illegible]
	IN - OUT						╳
	% REMOVAL	83.0	[illegible]	86.3	84.7	95.8	[illegible]
	LOAD- lbs/day	587	317	[illegible]	702	211	419
V S S mg/l	INFLUENT	128	[illegible]	[illegible]	[illegible]	236	[illegible]
	EFFLUENT	28	[illegible]	[illegible]	[illegible]	11	[illegible]
	IN - OUT						╳
	% REMOVAL	78.1	90.9	87.3	85.3	95.3	[illegible]
	LOAD –lbs/day	[illegible]	[illegible]	597	639	232	420
Settlable Solids ml/l	INFLUENT	4	6	[illegible]	740	[illegible]	[illegible]
	EFFLUENT		.1	[illegible]	[illegible]	0.0	nil
	IN - OUT	4		4	>40	>40	╳
	% REMOVAL		98.3	100	100	100	100
T O C mg/l	INFLUENT	82.5	[illegible]	[illegible]	[illegible]	220	[illegible]
	EFFLUENT	9.5		19	[illegible]	15	[illegible]
	IN - OUT	73					╳
	% REMOVAL	88.5	[illegible]	85.1	[illegible]	~~[illegible]~~/93.2	[illegible]
	LOAD - lbs/day	186	[illegible]	378	341	317	301

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

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Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Community · Gardens

DATE · OFF		12/09	12/10	12/11	12/15	12/14	AVERAGE or MEDIAN*
FLOW · MGD		[redacted]	[redacted]	2.388	2.559	2.534	2.471
KTELDAHL NITROGEN as N	CONC.-mg/l	15.1	15.1	14.0	15.4	16.8	15.3
	LOAD-lbs/day	296	319	279	328	355	315
AMMONIA NITROGEN as N	CONC.-mg/l	14.0	14.0	14.0	14.8	15.8	14.[illegible]
	LOAD-lbs/day	274	296.	279	315	334	300
ORGANIC NITROGEN as N	CONC.-mg/l	1.1	1.1	nil	0.6	1.0	[illegible]
	LOAD-lbs/day	21.5	23	0	13	21	16
$NO_2 \cdot NO_3$ as N	CONC.-mg/l	5.4	4.8	4.6	4.0	3.0	[illegible]
	LOAD-lbs/day	106	101	92	85	63	10
TOTAL PHOSPHORUS AS P	CONC.-mg/l	8.2	8.8	5.2	6.4	7.5	7.2
	LOAD-lbs/day	161	196	104	136	159	149
CHLORIDE	CONC.-mg/l	48	46	40	51	47	46.4
TOTAL COLIFORM	CONC.-MPN/100ml	<18	45	<18	230	<18	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 10, 1970
PLANT NAME: Community Utilities
PLANT OWNER: General Waterworks Corporation
ADDRESS 1826 Ponce de Leon Blvd., Coral Gables, Florida
TELEPHONE 444-7311 - 221-3033 Plant
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: #1 - 1.05 #2 - 1.00 MGD YEAR COMPLETED: #1 - 1954 #2 - 1960
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data
POPULATION SERVED 6,240 equivalent connections (21,840)

OPERATION ANNUAL COST No data
PERSONNEL 1 supervisor, 3 operators, 2 laborers, and 2 lift station operators.
LEVEL OF CERTIFICATION Supervisor - "B", two operators have "C".
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Feeder canal to Coral Gables Waterway WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Plant No. 1 - 2 primary tanks, 4 aeration units, 2 scondary clarifiers, and 2 chlorine contact chambers.

Plant No. 2 - 2 primary tanks, 2 aeration units, 2 secondary clarifiers, chlorine contact chambers.

SLUDGE TREATMENT None

DISPOSAL Hauled to Virginia Key Waste Water Treatment Plant

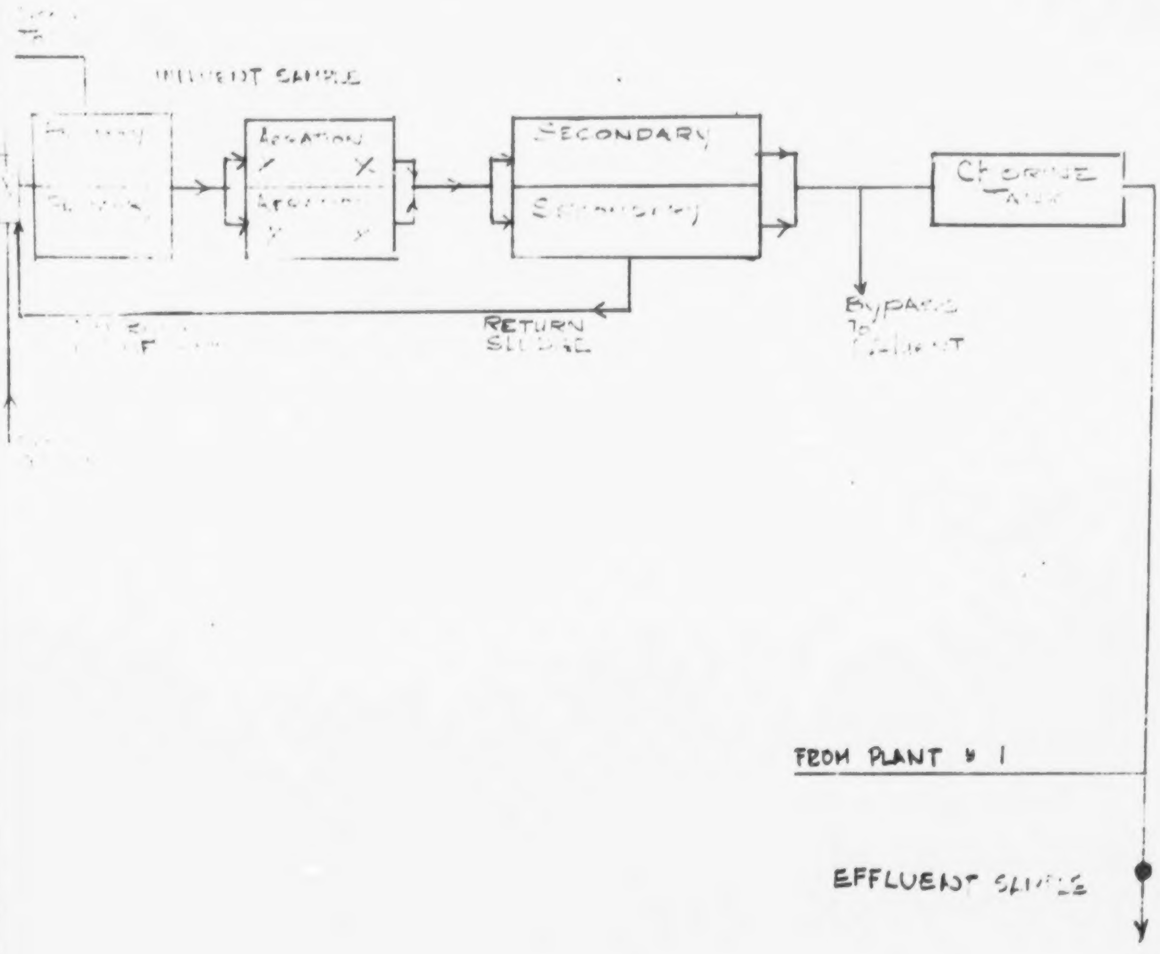
REMARKS

PARED BY:

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Community Utilities Plant #2

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES

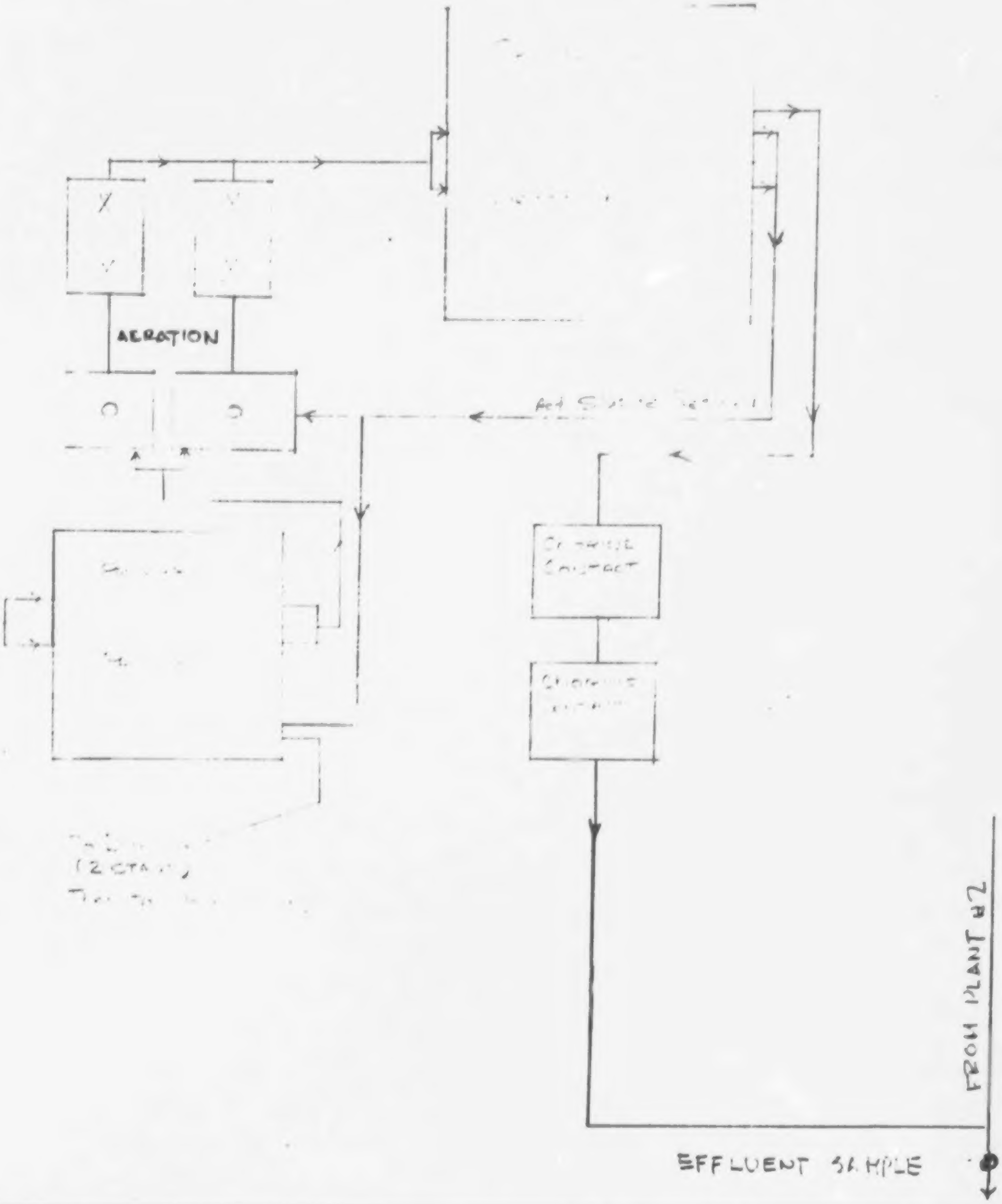

INFLUENT SAMPLE
AERATION
AERATION
SECONDARY
SECONDARY
CHLORINE TANK
RETURN SLUDGE
BYPASS TO EFFLUENT
FROM PLANT # 1
EFFLUENT SAMPLE

PREPARED BY:

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Community Utilities Plant #1

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


AERATION
CHLORINE CONTACT
(2 STA
FROM PLANT #2
EFFLUENT SAMPLE

PREPARED BY:

LOWER FLORIDA ESTUARY STUDY
Inspection Report on
Country Club of Miami Wastewater Treatment Plant
United Resources, Incorporated
6801 NW 186th Street
Miami, Florida

INTRODUCTION

This treatment plant was surveyed during the period January 17-22, 1971. At that time all units were operating satisfactorily.

Personnel involved in the survey were:

Robert Harp, Sanitary Engineer, EPA, DFI-DC
Larry Walz, Field Technician, EPA, DFI-DC
Terry Davis, Field Technician, Florida Department of Air and Water Pollution Control
Joe Hopson, Field Inspector, Dade County Pollution Control

Principal contacts at the plant were:

Mr. Conlon, Chief Operator
Mr. Froelich, Operator

Twenty-four composite samples were collected of the influent and the effluent from the ponds with the use of SERCO samplers.

INVENTORY

Waste treatment is provided by a Walker package treatment (contact stabilization) plant followed by oxidation ponds. Attachment 1 and Figure 1 provide additional information on the plant.

The following design information was collected:

Average Design Flow - 8330 gallons/hour (0.20 MGD)

Maximum Design Flow - 16,660 gallons/hour

Outer Tank Inside Diameter - 43 feet

Inner Tank Inside Diameter - 20.5 feet

Average Water Depth - 15 feet

Overflow Rate - 630 gallons/ft^2/day

Aerobic Digester Volume - 6,000 ft^3

Contact Aeration Tank Volume - 3,400 ft^3

Retention Time - 1.52 hours

Reaeration Tank Volume - 6,800 ft^3

Retention Time - 6.08 hours

Settling Tank Retention Time - 3.72 hours (Average Flow)

Chlorine Contact Chamber - 30 minutes

BOD lbs./day - 340 (2,000 population equivalent)

OBSERVATIONS AND DISCUSSION

Plant Operations

The plant is attended daily by an operator. Mr. Conlon is cognizant of his responsibilities for water pollution control and both he and Mr. Froelich are concerned about providing adequate treatment. Mr. Conlon presently holds a Class C operator license. Mr. Froelich is new to waste treatment plant operations. He is primarily responsible for day-to-day operations at the plant. He has had no operator training to date and could benefit from such training.

The following control tests are performed routinely:

Dissolved oxygen - effluent mechanical plant, pond effluent, and the 77th Avenue Canal (upstream and downstream of the discharge 4 times per month).

Settleable Solids - influent and effluent of the mechanical plant at weir.

Chlorine residual of mechanical plant effluent.

pH - influent and the mechanical plant effluent.

30-minute settleable solids - contact aeration tank.

A private laboratory (Aquachem) collects 24 hour composite samples twice monthly on the mechanical plant for the following analyses:

BOD
Total Solids
Fixed Total Solids
Suspended Solids
Fixed Suspended Solids
MLSS (aeration tank)

Waste sludge from the aerobic digester is pumped to a tank truck for subsequent disposal.

At the time of this survey, the aeration tank had a dark brown color and a slight musty odor. There was a slight amount of frothing but no large suds buildup. Some solids were observed going over the final weir. A layer of scum and floating material builds up on the clarifier surface. The operator indicated he breaks this up daily with a water hose. It is their intention to install spray nozzles on the circumference of the clarifier tank to control the foam build-up material.

The lagoons cover an area of approximately 16,000 square feet. Assuming an average depth of 3 feet, these lagoons would provide about two days total detention time. The lagoons had a healthy green color. Some algae mats had formed on the final cell surface.

RESULTS OF SAMPLING

Effluent samples were not collected for the first two days of the survey and influent samples were not collected on the second day because of a malfunction in the SERCO samplers. Moreover, the flow data for the 24 hour sampling period beginning on the morning of January 20 were decreased significantly because the main lift station failed at about 11:00 PM, January 20. Therefore, the average flow and the BOD and suspended solids removals were calculated for two days when there was no malfunction in either the system or the sampling equipment. On the basis of this data, the plant flow averaged 216,500 gallons per day. The average daily BOD load in was 280 lbs. and the load out was 15 lbs. resulting in a removal efficiency of 95 percent.

The suspended solids removal was approximately 85 percent. The Conferees to the Dade County Enforcement Conference held October 22, 1970, recommended that the State of Florida regulations for treatment of domestic and municipal wastes be met, i.e., 90 percent reduction of the organic load. This requirement was met in regards to the BOD removal, but not suspended solids. The chief operator stated that the results of sampling performed at a private laboratory show removals through the mechanical plant consistently above 90 percent for BOD and suspended solids. However, the removal efficiencies during the survey were based on effluent data from the ponds. The color of the ponds indicated they were rich with algae. This probably accounts for a significant portion of the suspended solids in the effluent. The TOC removals through the system were 80 percent and above for the two days of data used.

The data on the other parameters measured are contained in Attachment No. 2.

CONCLUSIONS

The treatment plant provides adequate BOD removals. The suspended solids removals are less than 90 percent. However, the algae in the pond effluent are responsible for a significant portion of the suspended solids.

RECOMMENDATIONS

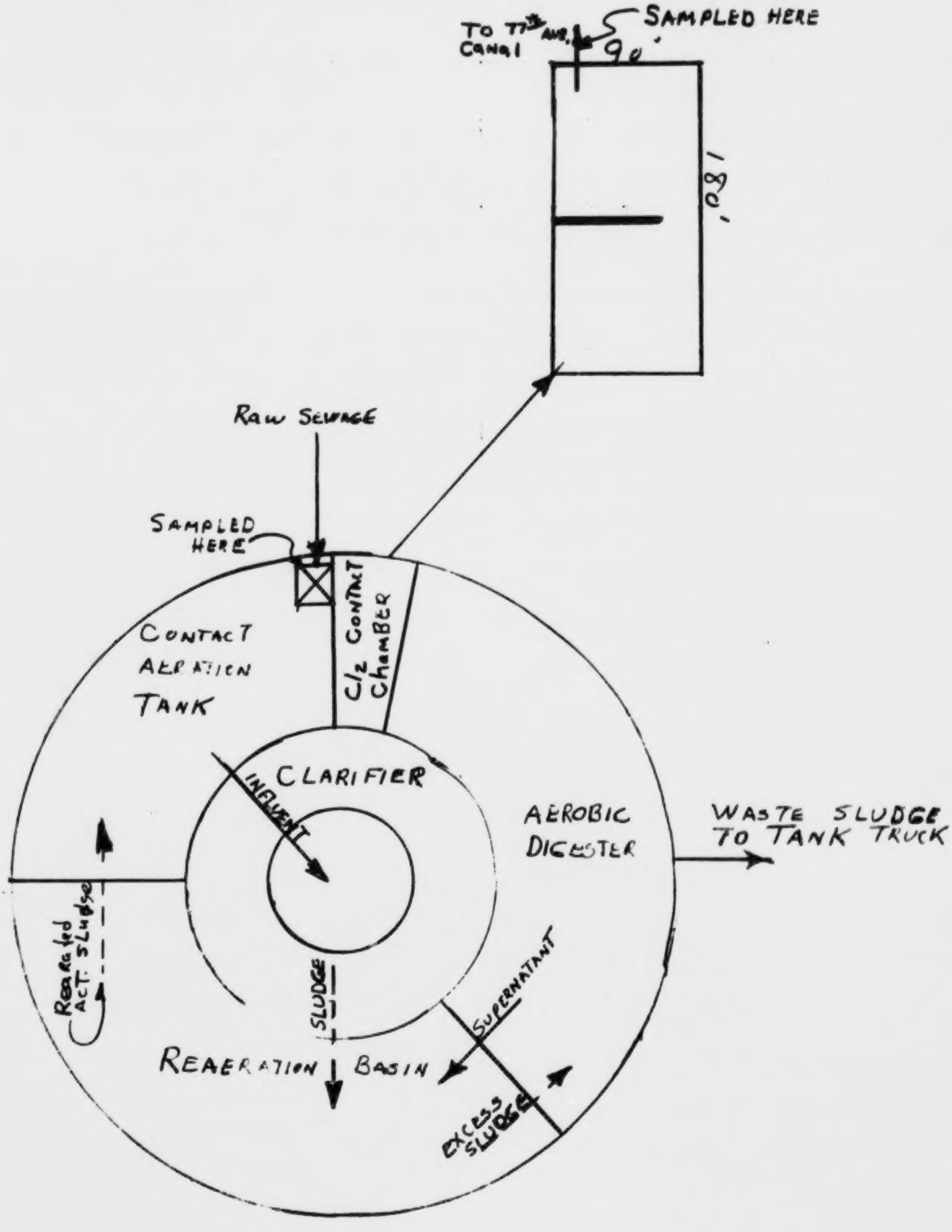
To enhance the treatment at this plant it is recommended that:

1. The operators be provided operator training. Mr. Froelich, for example, who has primary responsibility for day-to-day plant operations, is new to the waste treatment field and could benefit from operator training courses.
2. The algae mats which form on the lagoons be removed from the surface periodically in order that the photosynthesis may be increased.

Prepared By:

Robert D. Harp
Laurence R. Walz

Figure 1: Flow Diagram of County Club of Miami, Wastewater Treatment Plant


TO 77th Ave. Canal
SAMPLED HERE
90'
180'
RAW SEWAGE
SAMPLED HERE
CONTACT AERATION TANK
Cl_2 CONTACT CHAMBER
CLARIFIER
INFLUENT
AEROBIC DIGESTER
WASTE SLUDGE TO TANK TRUCK
Reaerated ACT. sludge
SLUDGE
SUPERNATANT
REAERATION BASIN
EXCESS SLUDGE

Sheet 194< of

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 17-22, 1971
PLANT NAME: Country Club of Miami
PLANT OWNER: United Resources, Incorporated
ADDRESS 6801 NW 18654, Miami, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE:
OWNER: United Resources, Incorporated
ADDRESS: Same as above
TELEPHONE

[illegible] AVERAGE DESIGN FLOW: 0.200 MGD YEAR COMPLETED:
[illegible] cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST Unknown
POPULATION SERVED 2,000 PE Design

OPERATION ANNUAL COST Unknown
PERSONNEL 3 operators
LEVEL OF CERTIFICATION Chief Operator has a Class C license
CONDITION OF EQUIPMENT Satisfactory
OUTFALL TYPE SIZE LENGTH 1/2 mile estimate
DISCHARGED TO: 77th Avenue Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Walker Process (Sparjair) contact aeration basin, re-aeration basin, clarifier basin, chlorine contact chamber, oxidation ponds.

SLUDGE TREATMENT Aerobic digester

DISPOSAL Waste sludge to tank truck for off-site disposal

REMARKS Control tests - DO performed on secondary effluent, oxidation pond effluent and upstream and downstream in the Canal (the stream tests are run 4 times per month). The others are performed daily. pH - raw and final plant effluent, settleable solids - influent and effluent, 30 minute - settling test on aeration tanks. Aquachem laboratory runs 24-hour composites on: BOD, total solids (fixed), and suspended solids on the influent and effluent. The laboratory does not composite after the ponds.

Reproduced from best available copy.

PREPARED BY: Robert Harp and Larry Walz

ATTACHMENT

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Sheet __of____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Country Club of Miami

DATE ON		17 Jan, 71	18 Jan 71	19 Jan, 71	20 Jan, 71	21 Jan, 71	AVERAGE
TIME ON		0915	1015	1015	1032	1032	
DATE OFF		18 Jan, 71	19 Jan 71	20 Jan, 71	21 Jan 71	22 Jan, 71	
TIME OFF		1015	1015	1032	1032	0838	
FLOW	START	3342426	3344569	3346639	3348734	3349516	
	END	3344569	3346639	3348734	3349516	3351698	
	TOTAL x100	2143	2070	2095	782	2180	
	24 hr. Flow Rate	205728	207,000	206,914	78,200	226,201	184,909
INF.	TEMP. ON	25	24	23.8	23.8	23.4	24.0
	PH - ON	6.5	6.5	6.5	6.4	6.5	6.5 *
EFFLUENT	TEMP - ON	22.5	24	22.4	14.8	22.8	22.4 (23.0)
	PH - ON	6.5	6.6	6.4	5.6	6.5	6.3 (6.5)
	Cl. Residual	> 1.5	<0.1	1.0	5.0 at 14:20 25	1.5	? 20.3 (1.0)
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
18 Jan, 71	Normal	Normal	Inf- 2-9-blank clock stopped Eff - no sample clock stopped was not wound tight.	
19 Jan, 71	Normal	Eff was dirty at tank due to wash down	Inf - no sample (3 taken) due to clock stopping	
20 Jan, 71	Normal	Normal	Inf #11 & 2 blank	
21 Jan, 71	Cl2 High	Main lift station out out @ 2330. Cl2 high	Eff #15-blank 14-10ml over 11-50ml	
22 Jan, 71	Normal-lt foam on polishing pond	Normal	Eff - #11-0ml Inf- #10-8ml 14-0	

* Average calculation in ( ) are made minus the data for 20 Jan, 71 when plant was at low flow.

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Sheet __ of _____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Country Club of Miami

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE
FLOW - MGD							
5 DAY BOD mg/l	INFLUENT	107	N/S	118	135	190	138
	EFFLUENT	N/S	11	10	6	7	4 × 8.5
	IN - OUT						
	% REMOVAL	N/A	N/A	91.5	95.6	96.3	94.5
	LOAD-lbs/day						
COD mg/l	INFLUENT	502	[illegible]	524	492	216	434
	EFFLUENT	N/S	49	58	40	34	45
	IN - OUT						
	% REMOVAL	[illegible]	[illegible]	88.9	91.9	84.3	88.4
	LOAD -lbs/day						
TSS mg/l	INFLUENT	76	N/S	80	60	192	102
	EFFLUENT	N/S	4	21	4	23	13
	IN - OUT						
	% REMOVAL	N/A	N/A	73.8	93.3	88.0	85.0
	LOAD- lbs/day						
VSS mg/l	INFLUENT	72	N/S	70	32	160	84
	EFFLUENT	N/S	3	19	4	17	11
	IN - OUT						
	% REMOVAL	N/A	N/A	72.9	87.5	89.4	83.3
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	4	N/S	3	3	18	7.0
	EFFLUENT	N/S	0.0	.2	0	00	.1
	IN - OUT						
	% REMOVAL	N/A	N/A	93.3	100	100	97.8
TOC mg/l	INFLUENT		N/S	90	65	125	88.8
	EFFLUENT	N/S	19	18	19	18	18.5
	IN - OUT						
	% REMOVAL	N/A	N/A	80.0	70.8	85.6	78.8
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Country Club of Miami

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	n/s	1.8	1.7	1.5	2.2	1.8
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	n/s	0.8	0.3	0.05	0.8	0.5
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	n/s	1.0	1.4	1.45	1.4	1.3
	LOAD-lbs/day						
NO_2 -NO_3 as N	CONC.-mg/l	n/s	1.8	1.6	0.2	1.5	1.3
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	n/s	6.7	6.4	6.5	7.7	6.8
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	27 Inf	29	29	30	35	30
TOTAL COLIFORM	CONC - MPN/100ml	3300	490,000	20	<18	20	20
Fecal COLIFORM	CONC - MPN/100ml	1300	[illegible]	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from Cutler Ridge Waste Water Treatment Plant

(Owned by Florida Water and Utilities Company)
Anchor Road and Puerto Rico Terrace
Cutler Ridge, Dade County, Florida
March 16, 1971

INTRODUCTION

The Cutler Ridge Waste Water Treatment Plant was surveyed during the period January 3 - 8, 1971. The system is composed of two contact stabilization units with final effluent combined in a single chlorine contact chamber and flowing to the Bel-Aire Canal. The Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent after chlorination. Daily grab samples were taken after chlorination, for chlorine residual, pH, and total and fecal coliform. Messrs. Terry Davis and Joe Hopson were sample collectors. Primary contacts were Messrs. Charles Price of Florida Water and Utilities, and Robert Cuevas of Greenleaf/Telesca, Engineers and Architects.

SUMMARY AND CONCLUSIONS

An average flow of 2.195 MGD was measured during the study period. The average five-day biochemical oxygen demand (BOD) of the influent and effluent were 208.6 and 20.5 mg/l respectively. An average BOD of 479 lbs per day was discharged to the Bel-Aire Canal. The average influent total suspended solids (TSS) concentration was 374 mg/l and an average loading of 1473 lbs per day was discharged and an average concentration of 78 mg/l. On two days of the survey the effluent was effectively chlorinated, but on January 5 and January 7, 1971, high bacterial concentrations were evident. No total and fecal coliform samples were analyzed for January 6, 1971.

The average BOD and total suspended solids removal efficiencies were affected by a malfunction in one of the secondary clarifiers on January 4, 1971, as is indicated by the low removal efficiencies on that date. A malfunction of the effluent sampler precluded calculation of removal efficiences on January 7, 1971.

This plant does not provide 90% removal of BOD or total suspended solids. The average BOD removal efficiency was 86.5 percent during the study, though the average removal efficiencies for days other than January 4, 1971, would have been in excess of 90 percent. The average total suspended solids removal efficiency was 73.8 percent, though the average removal efficiency would have been 86 percent if the efficiency for January 4, 1971, had not been included. The average removal efficiency was calculated from the daily removal efficiencies. The following are recommended to improve plant operation:

1. That present flow limitations be reviewed by the Dade County Pollution Control Board, to allow optimum operating conditions for efficient plant operation.

2. Modifications be made in the operation of the clarifiers to stabilize operation and to increase the removal of solids or installation of additional devices to reduce solids in the plant effluent.

3. Installation of more effective chlorine dosing facilities be made.

INVENTORY

The system is composed of two units, designated by the plant as phases. The individual components of each phase are as follows:

1. Phase 1

a) Four complete mix-activated sludge aeration tanks designed for a detention time of 3.9 hours at the average design flow of 2.0 MGD.

b) Eight secondary clarifiers designed for a detention time of 4.87 hours.

2. Phase 2

a) A circular aeration tank with 4 floating mechanical aerators, designed for a detention time of 5.0 hours at an average design flow of 2.0 MGD.

b) A circular clarifier designed for a detention time of 2.7 hours.

3. Facilities common to both phases.

a) A two-stage aerobic digestion system.

b) A chlorine contact chamber designed for a detention time of 25.4 minutes at peak flow.

DISCUSSION OF RESULTS

The average flow during the study period was 2.195 MGD, well under the 4.0 MGD designed flow for this plant. The average chlorine residual during the study was 1.8 mg/l. Disinfection of the effluent was effective on two of four days where coliform samples were collected. However, on January 5, 1971, the total and fecal coliform concentrations were

7900 mpn/100 ml and 2400 mpn/100 ml respectively, while on January 7, 1971, the total and fecal coliform concentrations were 1300 mpn/100 ml, and 170 mpn/100 ml, respectively.

The pollutional strength of the discharge and the efficiency of the plant were determined by the five-day biochemical oxygen demand (BOD), chemical oxygen demand (COD) and the total organic carbon (TOC) tests. The average BOD of the effluent was 20.5 mg/l and an average of 479 lbs. per day were discharged to the Bell Aire Canal. The removal efficiencies of BOD varied from 74.9 to 92.6 percent for an average of 86.5 percent on the four days where both influent and effluent samples were collected. On January 7, 1971, the effluent sampler malfunctioned, so that removal efficiencies could not be calculated for this date. The high effluent BOD and suspended solids concentrations in the effluent on January 4, 1971, correlate with the malfunction of the secondary clarifier on this date. The average removals of COD and TOC were 90.5 and 73.0 percent respectively.

The average removal of total suspended solids (TSS) was 73.8 percent. The average quantity of TSS in the effluent was 78 mg/l, or 1473 lbs. per day. As previously stated, the removal efficiency, average effluent concentration, and average load were influenced considerably by the poor performance of January 4, 1971. The plant is extremely efficient in removing settleable solids (SS), since on the average 99.7 percent were removed, with 100 percent removal on three of four days where effluent samples were collected.

Significant quantities of nutrients are discharged by this plant, principally in the form of ammonia nitrogen, 135 lbs. per day, and total phosphorus, 185 lbs. per day. Daily values of the data collected during the study are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

General appearance of the plant is good, with "housekeeping" and mechanical maintenance fair during the survey. Visual appearance of the effluent was adequate, with definite improvement as the survey progressed. During the night of January 3, 1971, a hopper in one of the secondary clarifiers became plugged, causing overflow of the sludge blanket and subsequent degradation in the quality of the effluent. This condition was discovered on the morning of January 4, 1971, and immediate corrective action was taken. However, removal efficiency did not recover until the latter part of the week.

The operator stated that the primary problem in plant operation is the low flow rate. The average flow during the survey was approximately 2.2 MGD. The operator felt that until additional flow was imposed, the plant could most satisfactorily be operated as only one unit. At the present time, there is a "freeze" on additions to the sewage system being imposed by the Dade County Pollution Control Board. Although the total hydraulic capacity of the two plants is 4.0 MGD, the Dade County Pollution Control Board has limited the system to a flow of 2.6 MGD because of digester capacity, but they have required that both plants be operated. I would recommend that the Dade County Pollution Control Board reconsider the limitations on this plant, and allow the operator to modify operating procedures for more efficient plant operation.

Robert L. King

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Sheet ___ of _____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 7, 1971
PLANT NAME: Cutler Ridge Wastewater Treatment Plant
PLANT OWNER: Florida Water and Utilities Company, Inc.
ADDRESS 230 Royal Palm Way, Palm Beach, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same
ADDRESS:
TELEPHONE

DESIGN | AVERAGE DESIGN FLOW: 4.0 MGD YEAR COMPLETED: Phase 1 -1952 (updated 1970) Phase 2 -1970
STREAM FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED 20,419 plus Cutler Ridge and Perrine Shopping Centers.

OPERATION | ANNUAL COST No data.
PERSONNEL Supervisor, 3 operators, 2 laborers, 2 lift station operators, mechanic and electrician.
LEVEL OF CERTIFICATION 3 operators with "C".
CONDITION OF EQUIPMENT Good
OUTFALL | TYPE Submerged SIZE LENGTH
DISCHARGED TO: Bell Aire Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT | (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Complete mix activated sludge (both phases) with secondary clarification and common chlorine contact chamber.

SLUDGE | TREATMENT Two stage aerobic digestion then to sludge drying beds.

DISPOSAL Haul to dump.

REMARKS

EPARED BY: Robert L. King

Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Cutler Ridge

DATE ON		3 Jan, 71	4 JAN 71	5 JAN 71	6 Jan 71	7 Jan, 71	AVERAGE
TIME ON		1030	1312.	1315	1408	1308	☒
DATE OFF		4 Jan, 71	5 JAN 71	6 Jan 71	7 Jan 71	8 Jan 71	☒
TIME OFF		1312	1315	1408	1308	1258	☒
FLOW	START	1,028,656	1,031,269		1035209	1037755	☒
	END	1,031,269		1035209	1037755	1039878	☒
	TOTAL x1,000	2,613	2,170	2,170	2046		☒
	24 hr. Flow Rate	2,348,761	2,179,141	2,179,141	2,134,957	2,131,883	2,194,777
INF.	TEMP. ON	26	27	26.4	26.5	27	26.6
	PH - ON	7.2	7.1	6.9	6.9	7.2	7.1
EFFLUENT	TEMP - ON	26.5	26.5	26.4	27	27	26.7
	PH - ON	7.1	7.0	6.8	6.9	7.0	7.0
	Cl. Residual	1.5	1.0	2.5	2.5	1.5	1.8
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
3 Jan, 71	Normal	Normal	-	
4 Jan, 71	Normal	~~Normal~~ Skimmer went out approx 1800 - Repaired 0815	Inf-#12 & 2-blank Eff-#20-solids	
5 JAN 71	Normal	Normal	Inf # 5 & 6 blank Eff 22,2	
6 Jan, 71	Normal	Normal	Inf-over Only inf sampler put back in	
7 Jan, 71	Normal	Normal	Inf #1,2,3,4,6,&22-blank	
8 Jan, 71	Normal	Normal	Inf-2,4 blank Eff over	

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Sheet ___of_______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT - DATA SUMMARY

PLANT Cutler Ridge

DATE - OFF		1-4-71	1-5-71	1-6-71	1-7-71	1-8-71	AVERAGE
FLOW - MGD		2.349	2.179	2.179	2.135	2.132	2.195
5 DAY B O D mg/l	INFLUENT	171	199	209	251	213	208.6
	EFFLUENT	4[illegible]	20	15.5	NS	24	20.5
	IN - OUT	128	179	193.5	N/S		
	% REMOVAL	74.9	89.9	92.6		88.7	86.5 90.2
	LOAD-lbs/day	842	363	282		427	479
C O D mg/l	INFLUENT	596	726	716	743	791	714.4
	EFFLUENT	74	54	62	N.S.*	74	66
	IN - OUT	522	672	654	N/A⊕	717	
	% REMOVAL	87.6	92.6	91.3	N/A	90.6	90.5
	LOAD -lbs/day	1450	981	1127		1316	1219
T S S mg/l	INFLUENT	256	216	[illegible]	436	664	374
	EFFLUENT	164	35	[illegible]	N.S.	74	78
	IN - OUT	92	181	260	N/A	590	
	% REMOVAL	35.9	83.8	76.7	N/A	88.9	73.8
	LOAD- lbs/day	3213	636	727		1316	1473
V S S mg/l	INFLUENT	244	136	[illegible]	428	648	342
	EFFLUENT	140	32	[illegible]	N.S.	66	69
	IN - OUT	104	104	215	N/A	582	
	% REMOVAL	42.6	76.5	45.3	N/A	89.8	73.6
	LOAD –lbs/day	2743	582	672		1174	1293
Settlable Solids ml/l	INFLUENT	7.0	7.0	8.0	4.0	8.0	7
	EFFLUENT	0.1	0.0	0.0	N.S.	0.0	0
	IN - OUT	6.9	7.0	8.0	N/A	8.0	
	% REMOVAL	98.6	100	100	N/A	100	99.7
T O C mg/l	INFLUENT	102.5	[illegible]	116	[illegible]	120	116
	EFFLUENT	36	19	32	N.S.	[illegible]	29
	IN - OUT	67	62.5	84.5	N/A	92	
	% REMOVAL	65.4	77.0	72.8	N/A	76.7	73.0
	LOAD - lbs/day	705	345	582		498	533

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* no sample

⊕ not applicable

Released

From The Desk Of

Michael V. Polito

Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

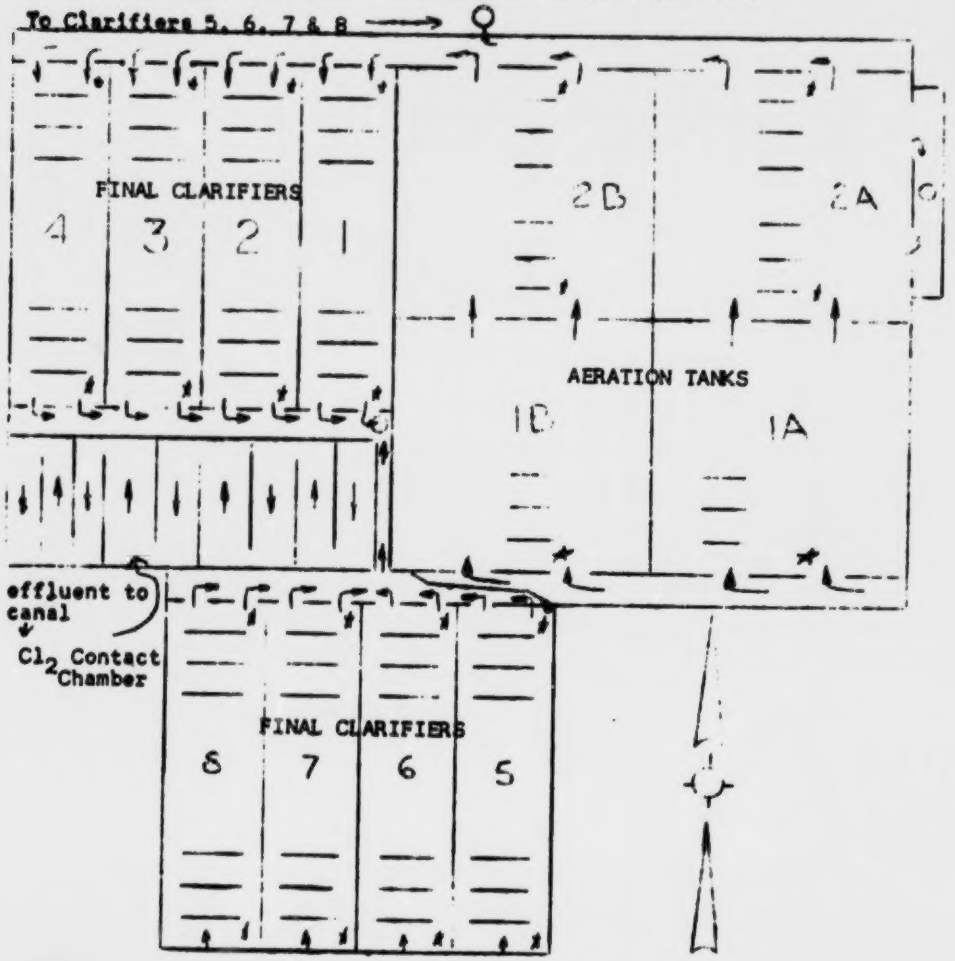
PLANT Cutler . Ridge

DATE - OFF		1/4/71	1-5-71	1-6-71	1-7-71	1-8-71	AVERAGE or MEDIAN*
FLOW - MGD		2.349	2.179	2.179	.	2.132	2.195
KTELDAHL NITROGEN as N	CONC.-mg/l	8.6	9.5	8.8	N.S.	10.4	9.3
	LOAD-lbs/day	168	173	160		185	172
AMMONIA NITROGEN as N	CONC.-mg/l	5.6	7.2	6.8	N.S.	9.5	7.4
	LOAD-lbs/day	110	131	124		174	135
ORGANIC NITROGEN as N	CONC.-mg/l	3.0	2.3	2.0	N.S.	0.6	2.0
	LOAD-lbs/day	59	42	36		11	37
NO_2 -NO_3 as N	CONC.-mg/l	3.0	0.2	0.2	N.S.	0.2	.9
	LOAD-lbs/day	59	4	4		4	18
TOTAL PHOSPHORUS AS P	CONC.-mg/l	10.8	13.0	8.2	N.S.	8.0	10.0
	LOAD-lbs/day	212	236	149		142	185
CHLORIDE	CONC.-mg/l	68	73	67	N.S.	68	69
TOTAL COLIFORM	CONC.-MPN/100ml	<15	7900		1300	<18	
Fecal COLIFORM	CONC.-MPN/100ml	<13	2400		170	<18	

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Plant 1 - Sketch

DAILY ANALYSIS - CUTLER RIDGE WASTE WATER PLANT


To Clarifiers 5, 6, 7 & 8 ⟶
FINAL CLARIFIERS
4
3
2
1
2B
2A
AERATION TANKS
1B
1A
effluent to canal
Cl2 Contact Chamber
FINAL CLARIFIERS
8
7
6
5

Date:____________________

AERATION TANKS - 8:30 a.m.

Susp. Sol. 2A -

2B -

Set. Sol. 2A -

2B -

SVl 2A -

2B -

Cl_2 Residual -

DIGESTER

D.O. -

Susp. Sol. -

~~Sat.~~ Sol. -

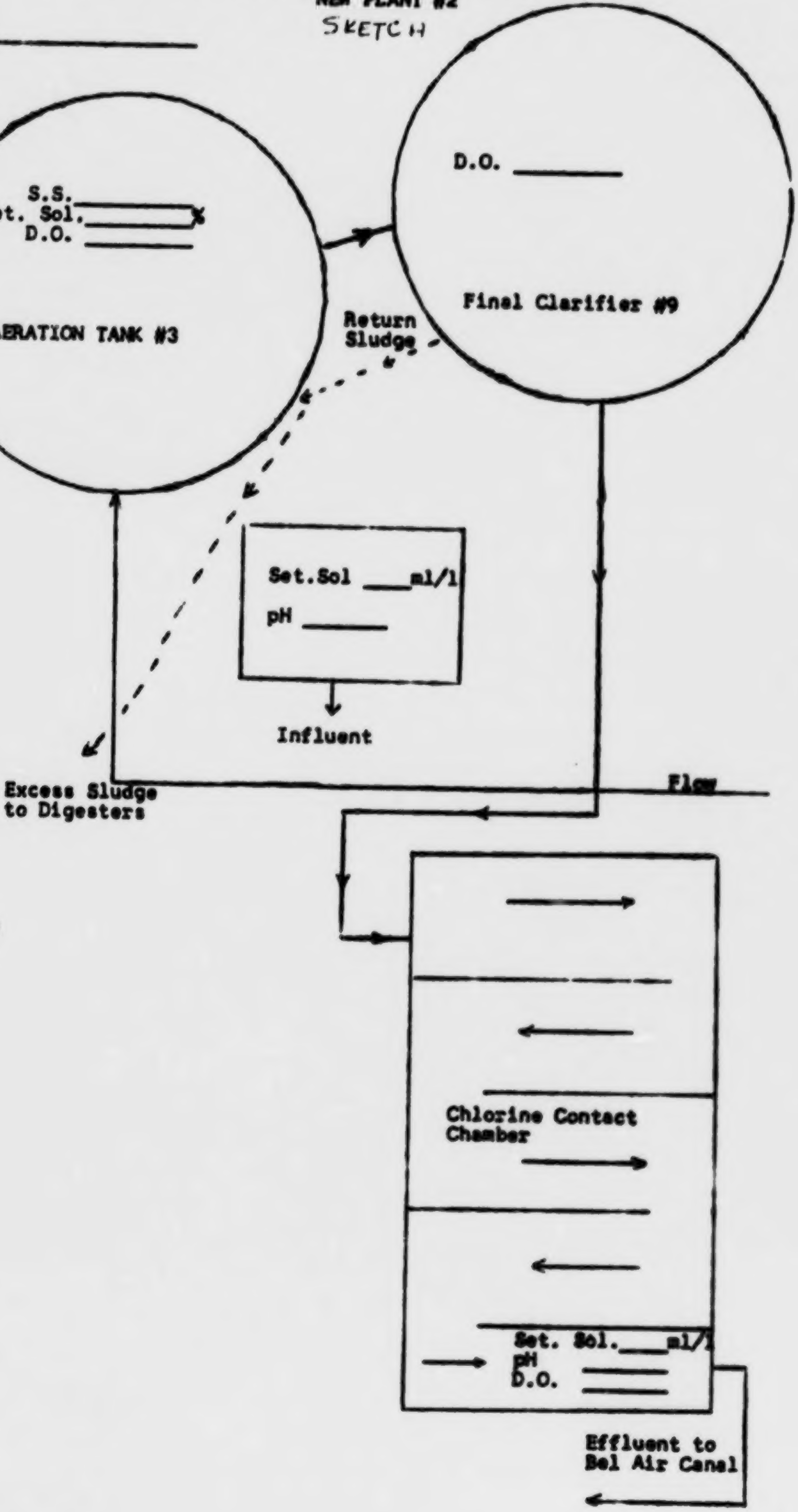
REMARKS:

Legend: Readings next to stars (*) are for D.O. and time of readings are from top to bottom 8:30 a.m., 12:30 p.m. & 3:30 p.m. unless noted otherwise.

DAILY TESTS - CUTLER RIDGE SEWAGE TREATMENT PLANT
NEW PLANT #2

SKETCH

DATE: ____________________


S.S. ________
Set. Sol. ________%
D.O. ________
AERATION TANK #3
D.O. ________
Final Clarifier #9
Return Sludge
Set.Sol ____ml/l
pH ________
Influent
Excess Sludge to Digesters
Flow
Chlorine Contact Chamber
Set. Sol. ____ml/l
pH ________
D.O. ________
Effluent to Bel Air Canal

Remarks:

Lower Florida Estuary Study
Report on Waterborne Wastes from
Doral Country Club
N.W. 50th Street and 92nd Avenue
Miami, Dade County, Florida
January 12, 1971

INTRODUCTION

The Doral Country Club Waste Water Treatment Plant was surveyed during the period December 6 - 11, 1970. The plant is composed of two Dodge-White aeration units in parallel. Final effluent flows into a lake on the Club property, through a series of canals and lakes, off the property and into the Dressels Dairy Canal. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent (after chlorination). Messrs. Terry Davis and George Egermier were the sample collectors. Primary contact was Mr. Tony Ruane, Chief, Engineering Section, Doral Country Club.

SUMMARY AND CONCLUSIONS

The average five-day biochemical oxygen demand (BOD_5) in the influent of the Doral Country Club Waste Water Treatment Plant was 295 mg/l and the average concentration in the effluent was 28.3 mg/l. The average concentrations of total suspended solids (TSS) in the

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influent and effluent were 218 and 53.6 mg/l respectively. The median concentrations of total and fecal coliform were both 20 MPN per 100 ml, although high values of 1700 MPN per 100 ml for total coliform and 170 MPN per 100 ml for fecal coliform did occur on December 8, 1970.

This plant did not meet the Dade County performance criteria for BOD_5 and TSS which requires an average removal efficiency of 90% with no values less than 85%. The average BOD_5 removal efficiency was 90.1%, although, on December 8, 1970, 79.5% of the BOD_5 was removed. The average TSS removal efficiency was extremely poor at 57.6%. The average removal efficiencies were calculated from the daily removal efficiencies.

The following are recommended to improve the operation of this plant:

1. The installation of a flow measuring device.
2. The final clarifiers be evaluated to determine if operating procedure or the size of the clarifier or sludge return equipment are the cause of the low suspended solids removal efficiency.
3. The chlorine dosage be more carefully controlled to insure effective chlorination at all times.
4. The plant operators should proceed to obtain a Florida treatment plant operator's license.

INVENTORY

The system consists of two Dodge-White aeration units, followed by a chlorine contact chamber. The Dodge-White system consists of aeration and reaeration zones, plus a final or secondary clarifier. The effluent from the two units is combined and flows through a chlorine contact chamber.

DISCUSSION OF RESULTS

The Doral Country Club Waste Water Treatment Plant does not have a flow meter. However, a flow meter located at the Club's water treatment plant was used to estimate flow through the waste water treatment plant during the study. All treated water, except make-up for the swimming pool, should be treated by the waste water facility. The daily quantity of make-up water used in the swimming pool is not known. The average flow measured at the water plant during the study was 0.215 MGD. On December 28, 1970 between 12:45 p.m. and 1:15 p.m., flow measured at the effluent weir of the chlorine contact chamber averaged 0.264 MGD. Therefore, it appears that almost all of the treated water is received by the waste water treatment plant. For this reason the daily flow at the water plant was used to estimate the waste loads being discharged by the waste treatment plant.

The average influent BOD_5 of this treatment plant was 295 mg/1 and an average of 53 lbs. per day were discharged by the plant at an average concentration of 28.3 mg/1. The average BOD_5 removal efficiency was 90.1%. Removal efficiencies for total organic carbon (TOC) and chemical oxygen demand (COD) were considerably lower averaging 63.9% and 77.5% respectively.

Total suspended solids removal efficiencies averaged 57.6% during the study, and ranged from 6.7 to 98.2%, indicating a severe problem. However, 97.7% of the settleable solids were removed.

The effluent of this plant was not highly nitrified. Ten lbs. per day of organic nitrogen and nine lbs. per day of ammonia nitrogen were discharged, but only three lbs. per day of nitrite-nitrate nitrogen were discharged.

The effluent was generally effectively chlorinated with an average chlorine residual of 4.2 mg/l and median total and fecal coliform concentrations of 20 MPN/100 ml. Although, on December 8, 1970, the chlorine residual was zero and, as expected, high bacterial concentrations were observed.

The daily values for the parameters evaluated during this study are presented on the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

The general appearance of the plant is fair. "Housekeeping" was fair and there were no mechanical problems during the survey period. Visual appearance of the effluent was poor, as there was visual evidence of suspended or settleable solids. Sampling personnel reported turbidity and a heavy floc flowing over the final weir on both December 7th and

December 8th. To remedy this, we recommend that the final clarifiers be evaluated to determine if operating procedure or the size of the clarifier or sludge return equipment is the cause of the low suspended solids removal efficiency. In addition, there is no means of measuring flow in the plant. We recommend installation of a flow measuring device.

The operators of this plant are not licensed. It is, therefore, recommended that the plant operators proceed to obtain a Florida treatment plant operator's license.

Doral Country Club should be commended for recycling both the effluent and sludge from this plant. The effluent flows into a lake on the Club property and water from this lake is used to irrigate the golf course. Dried sludge is used for fertilizer.

LAWRENCE W. OLINGER

ROBERT L. KING

Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Doral S.T.P.

DATE ON		6 Dec 70	7 Dec 70	8 Dec 70	9 Dec 70	10 Dec 70	AVERAGE
TIME ON			1228	1125	1135	1245	
DATE OFF		7 Dec 70	1125	9 Dec 70	10 Dec 70	11 Dec 70	
TIME OFF		1228	8 Dec 70	1135	1245	1219	
FLOW	START	-	66153100	66382500	66586200	68011000	
	END	66153100	66382500	66586200	68011000	67021600	
	TOTAL	-	~~227,400~~	203,700	424,800	10,500	
	24 hr. Flow Rate	-	239,400	203,700	407,800	10,500	215,400
INF.	TEMP. ~~ON~~ OFF	28.1°C	29.3°C	28.9°C	29.9°C	29.6°C	29.2
	PH - ~~ON~~ OFF	6.7	6.89	7.2	—	* 10.2	6.8
EFFLUENT	TEMP - ~~ON~~ OFF	29.8°C	27.6°C	27.5°C	28.0°C	27.6°C	28.1
	PH - ~~ON~~ OFF	6.7	6.8	6.9	-	* ~~10.2~~ [illegible]	6.8
	Cl. Residual	2.0	0/white	3.0 est.	8.0 est	8.0 est	4.2
	CHLORINE-ON	-	-	-	-	-	
	CHLORINE-OFF	-	-	-	-	-	
	ON-OFF-lbs	-	-	-	-	-	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
6 Dec		Stronbcder around plant		GAE
7 Dec 70	Heavy floc seen portion of time going thru final weir	Normal/suds in AT.	over →	GAE
8 Dec 70	Brown turbid with heavy floc. Suds in Cl2 channel. One used sewage related article floating in Cl2 channel	* ~~over~~ →	16 Inf blank 24 Eff short 11 Eff tripped @ 1030	GAE
9 Dec 70	Turbid	No influent due to malfunctioning check valve in lift station		GAE
10 Dec 70	Turbid	Suds in aerator + Cl2 contact channel + after final weir		GAE
11 Dec 70	Turbid	Suds in Cl2 channel	over	GAE

[illegible] — 1.84 [illegible] at 27.1°C [illegible] 10.2 [illegible]

Sheet 215< of ____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Doral S.T.P.

DATE - OFF		12/7	12/8	12/9	12/10	12/11	AVERAGE
FLOW - MGD		0.215 *	0.239	0.204	0.408	0.010	0.215
5 DAY BOD mg/l	INFLUENT	317	261	313	302	281	295
	EFFLUENT	32	53.6	27.3	15.8	13	28.3
	IN - OUT		207.4	285.7	286.2	268	
	% REMOVAL	[illegible]	79.5	91.3	94.8	95.4	90.1
	LOAD-lbs/day	57	107	46	54	1	53
COD mg/l	INFLUENT	731	786	787	772	836	776.4
	EFFLUENT	255	187	142	150	129	172.6
	IN - OUT		599	645	522	677	
	% REMOVAL	65.1	76.2	82.0	80.6	84	77.5
	LOAD -lbs/day	457	372	241	510	11	[illegible]
TSS mg/l	INFLUENT	248	60	112	184	488	218
	EFFLUENT	100	56	59	44	9	53.6
	IN - OUT	148	4	53	140	479	
	% REMOVAL	59.7	6.7	47.3	76.1	98.2	57.6
	LOAD- lbs/day	[illegible]	112	100	150	1	[illegible]
VSS mg/l	INFLUENT	32	24	64	12	480	122.4
	EFFLUENT	106	52.	55	[illegible]	5	46
	IN - OUT	0	0	9	0	475	
	% REMOVAL	0	0	14.1	0	98.9	26.0
	LOAD -lbs/day	190	104	94	41	0	[illegible]
Settlable Solids ml/l	INFLUENT	18	10	8	14	12	12.4
	EFFLUENT	1	0.2	.1	.4	n.1	.34
	IN - OUT	17	9.8	7.9	13.6	12	
	% REMOVAL	94.4	98	98.8	97.1	100	97.7
TOC mg/l	INFLUENT	158	130	130	[illegible]	182.5	155
	EFFLUENT	71	50	40.5	[illegible]	70	56
	IN - OUT	87	80		126.5	112.5	
	% REMOVAL	55.1	61.5	68.8	72.3	61.6	63.9
	LOAD - lbs/day	127	100	69	165	6	93

INFLUENT BOD POPULATION EQUIVALENT = 3112

EFFLUENT BOD POPULATION EQUIVALENT = 312

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* Average flow during study

From The Desk Of
Michael V. Polito

Sheet____ of 216<

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Doral S.T.P.

DATE - OFF		12/7	12/8	12/9	12/10	12/11	AVERAGE or MEDIAN*
FLOW - MGD		0.215‡	0.239	0.204	0.408	0.010	0.215
KTELDAHL NITROGEN as N	CONC.-mg/l	12.9	11.2	11.8	9.2	8.7	10.6
	LOAD-lbs/day	23	22	20	31	1	19
AMMONIA NITROGEN as N	CONC.-mg/l	3.5	6.4	4.5	6.0	4.5	5.0
	LOAD-lbs/day	6	13	8	20	0	9
ORGANIC NITROGEN as N	CONC.-mg/l	9.4	4.8	7.3	3.2	4.2	5.8
	LOAD-lbs/day	17	10	12	11	0	10
NO_2 -NO_3 as N	CONC.-mg/l	2.0	1.2	0.8	2.4	0.2	1.3
	LOAD-lbs/day	4	2	1	8	0	3
TOTAL PHOSPHORUS AS P	CONC.-mg/l	5.8	8.5	6.8	7.0	5.5	6.7
	LOAD-lbs/day	10	17	12	24	0	13
CHLORIDE	CONC.-mg/l	56	58	55	50	57	55
TOTAL COLIFORM	CONC.-MPN/100ml	20	1,700	<18	<18	230	20
Fecal COLIFORM	CONC.-MPN/100ml	20	170	<18	<18	45	20

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

‡ Average flow during study period.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

Sheet ___ of ______

DATE OF VISIT December 10, 1970
PLANT NAME: Doral Country Club
PLANT OWNER: Doral Country Club
ADDRESS N.W. 50th Street and 92nd Avenue, Miami, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above.
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 0.170 MGD YEAR COMPLETED: 1965
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED Approximately 1000 guests, 500 employees, Clubhouse facilities, and dining room facilities.

OPERATION ANNUAL COST No data.
PERSONNEL Two operators.
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE Lake on Golf Course, then to Dressels Dairy Canal. SIZE LENGTH
DISCHARGED TO: WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Splitter box to two identical units. Each unit consists of aeration zone (blower driven aeration), reaeration zone, then secondary clarifier. Effluent from each unit is then combined and flow is through a contact chamber to a lake on Club property.

SLUDGE TREATMENT An aerobic digester to sludge drying beds.

DISPOSAL Dried sludge is mixed with soil and used as fertilizer on the Golf Course grounds.

REMARKS

BY:

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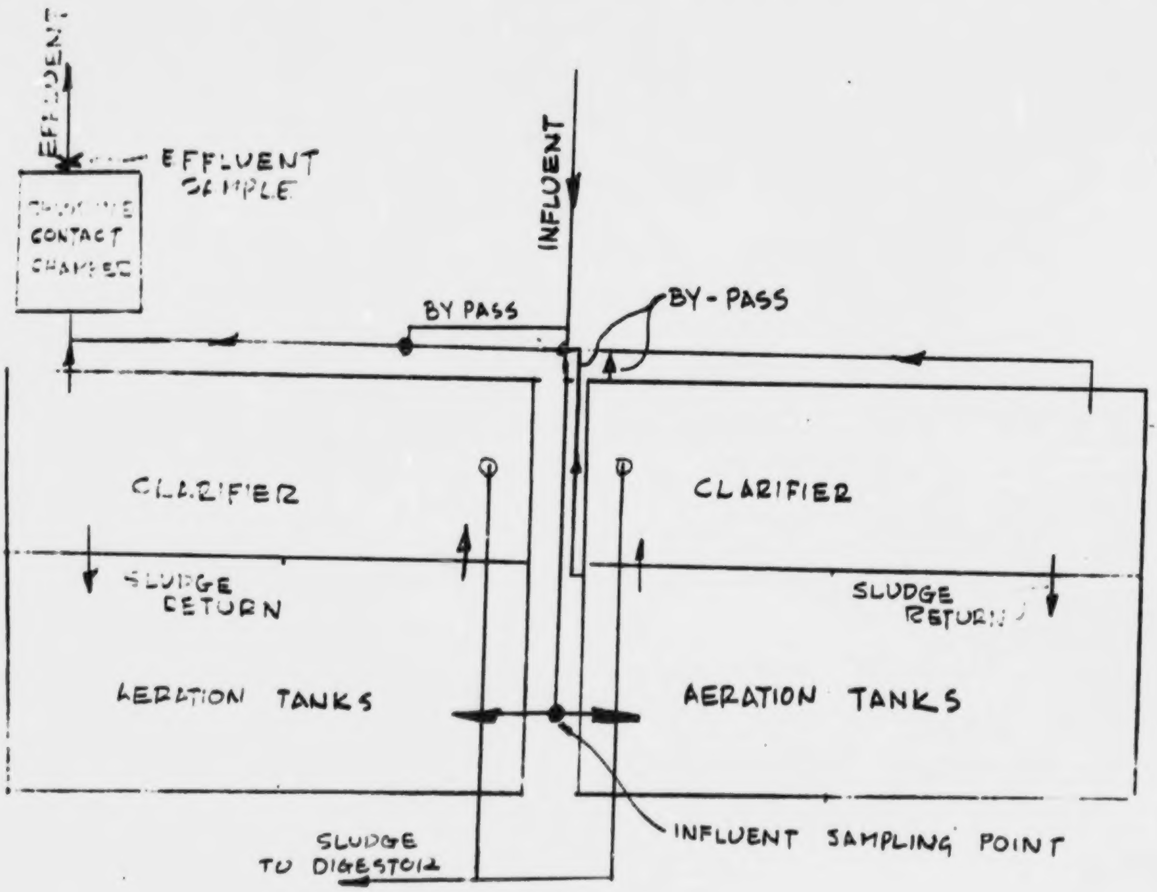
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM
PLANT DORAL COUNTRY CLUB

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


EFFLUENT
EFFLUENT SAMPLE
CHLORINE CONTACT CHAMBER
INFLUENT
BY PASS
BY-PASS
CLARIFIER
CLARIFIER
SLUDGE RETURN
SLUDGE RETURN
AERATION TANKS
AERATION TANKS
INFLUENT SAMPLING POINT
SLUDGE TO DIGESTOR

PARED BY: L. OLINGER

LOWER FLORIDA ESTUARY STUDY
Inspection Report On
Golden Isles Wastewater Treatment Plant
Golden Isles Utilities
2459 NE 204th Street
Miami, Florida

INTRODUCTION

The Golden Isles wastewater treatment plant was surveyed during the period January 17-22, 1971. Treatment is accomplished by the contact stabilization process.

SERCO samplers were used to sample the influent and effluent. The influent was sampled prior to pre-chlorination - the effluent after the chlorination chamber (Figure 1). A seed sample was collected only for use in performing the effluent BOD analyses. Grab samples were collected daily for bacteriological analyses and chlorine residual.

Personnel involved in the survey were:

Robert Harp, Sanitary Engineer - EPA, DFI-DC
Larry Walz, Field Technician - EPA, DFI-DC
Terry Davis, Field Technician - Florida Department of Air and Water Pollution Control
Joe Hopson, Field Inspector - Dade County Pollution Control

Principal contacts of Golden Isles Utilities were:

Joe Dimazio, Superintendent
Clyde Brown, Chief Operator

During the survey, all units in the plant operated satisfactory except for the loss of chlorination facilities for several hours on January 20. On this date, one of the pumping stations malfunctioned. When pumping commenced, subsequent hydraulic conditions at the plant resulted in suspended solids going over the weir.

Except for several small businesses such as restaurants and laundromats, this plant receives only domestic sewage.

INVENTORY

Information on the unit processes are included on Attachment 1. Figure 1 is a schematic diagram of the plant.

The plant was placed in operation in 1962; the sludge drying beds were constructed in 1970.

The average design flow and design BOD are 0.500 MGD, and 850 lbs/day respectively. According to Mr. Brown, the average daily flow has been about .650 MGD. Flow during wet weather reaches 0.800 MGD. The plant is usually operating at or under its design flow. The increase in flow generally begins about mid-December, remains above design flow until mid-January and then decreases to or below design capacity until Easter.

DISCUSSION

Plant Operation

One operator and one maintenance man are employed. Mr. Brown has a Class A Operator's license. An operator is on duty five days per week. The plant receives periodic inspections during weekends. Mr. Brown is a competent operator. Plant maintenance was good.

Pre-chlorination and post-chlorination are practical. Mr. Brown indicated he uses approximately 125 lbs. of chlorine per day - 25 lbs. of this is for pre-chlorination. At design flow this means the feed rate is 6 mg/l for pre-chlorination and 24 mg/l for effluent disinfection. According to Mr. Brown, pre-chlorination is practiced to decrease the BOD load. The effluent feed rate is 3 times that recommended for disinfection of activated sludge plant effluent.[1] It is possible that effective disinfection could be obtained at lower dosage rates thus a chlorine savings could be realized.

The following control tests are performed in the plant laboratory:

Settleable Solids - influent and effluent.

DO - contact stabilization basin, settling tank, and effluent.

pH.

Sludge Settleable Solids (30-minute test) - contact and re-aeration tanks.

Chlorine Residual.

Routine BOD and suspended and total solids are also run on the influent and effluent. The DO and BOD are measured above and below the outfall once per week. The outfall discharges to the Oleta River about 0.2 miles from the plant. No pollution problems were readily apparent by visual inspection of this area. Mr. Brown related that several years ago the Utilities Company had been required to dredge the accumulated sludge deposits from the Oleta River for a distance of several hundred feet downstream.

A private laboratory also conducts monthly tests on the plant to determine its efficiency for meeting the BOD, suspended solids, settleable solids and bacteriological criteria of Dade County. The results of these

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[1] WPCF Manual of Practice No. 8, "Sewage Treatment Plant Design," Water Pollution Control Federation, Washington, D. C., 1959.

tests are subsequently submitted to the pollution control authorities.

Results of Survey Sampling

The average flow for the five-day study period was .642 MGD, which is significantly higher than the design flow of .500 MGD. The chlorine residual was generally greater than 1.5 mg/l except for January 20, 1971, when a loss of pressure in the chlorine tank caused the residual to fall to < 0.1 mg/l. This situation was corrected by Mr. Brown immediately after discovery. Assuming 25 lbs. chlorine per day for pre-chlorination and 100 lbs./day for effluent disinfection, the chlorine feed rates are approximately 4.5 mg/l and 18 mg/l respectively at the flow of 0.642 MGD.

The data were evaluated to determine compliance with the recommendations of the Conferees to the Dade County Enforcement Conference held October 22, 1970. The recommendations require compliance with the State of Florida regulations for waste treatment, i.e., 90 percent removal of the organic material in domestic and municipal wastewaters. A review of the data shows that the average BOD, and the suspended solids removals were approximately 82 percent and 80 percent respectively. The BOD load to the plant was about 1000 lbs/day which is 18 percent above the design BOD loading. The daily removal efficiency for suspended solids averaged 90 percent or above during four days of the survey. However, the sample results for the 24-hour period commencing the morning of January 20, indicate a removal of only 30 percent. A malfunction in the pumping station occurred during this same period. The station commenced sampling shortly after the SERCO samplers were set (i.e., after 8:30 AM). Hourly samples collected on the morning of January 20 contained significant solids due to the resulting "surge" when the station commenced pumping.

CONCLUSIONS

The data indicate that this plant is capable of providing adequate removal of suspended solids when all units in the system function properly.

The hydraulic and organic load capacities were exceeded during the survey period resulting in BOD removal efficiencies of less than 90 percent.

RECOMMENDATIONS

To improve treatment at this plant, it is recommended that:

1. The plant capacity be increased to handle the hydraulic and organic loads presently imposed on the system.
2. A low pressure warning system be installed on the chlorination system to alert operator that the chlorine tank is near empty.

Prepared By:

Robert D. Harp
Laurence R. Walz

Attachment #1

Sheet ___ of _____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 17-January 22, 1971

PLANT NAME: Golden Isles Wastewater Treatment Plant

PLANT OWNER: Golden Isles Utilities

ADDRESS: 2459 NE 204 Street

TELEPHONE: 947-8121

COLLECTION SYSTEM – TYPE: Separate - Sanitary

OWNER: Golden Isles Utilities

ADDRESS: Same

TELEPHONE: 947-8121

DESIGN AVERAGE DESIGN FLOW: 0.500 MGD YEAR COMPLETED: 1962, added drying beds in 1970.

STREAM FLOW cfs DURATION days FREQUENCY Yrs

CONSTRUCTION COST Unknown

POPULATION SERVED 6,000 Est. (3030 meters plus trailer park of 300 units)

Serves unincorporated area.

OPERATION ANNUAL COST Check with Accountant - Golden Isles Utilities

PERSONNEL Superintendent of Utilities Co., Chief, Plant Operation, 1 maintenance man

LEVEL OF CERTIFICATION Class A

CONDITION OF EQUIPMENT Good - All units working satisfactory

OUTFALL TYPE SIZE LENGTH 0.20 mile (est.)

DISCHARGED TO: Oleta River WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Bar Screen, Contact Stabilization, Re-Aeration Tank, Clarifer, CL_2 Contact Chamber.

SLUDGE TREATMENT Aerobic digestors (primary and secondary)

DISPOSAL Waste sludge to drying beds.

REMARKS Laboratory available. Control tests performed. Settleable Solids - Influent and effluent; DO from contact stabilization chamber, settling tank, and effluent; chlorine residu pH, 30 minutes setteable solids from contact stabilization and reaeration tanks, BOD-I & E; suspended solids - I & E, and total solids (I & E) are performed routinely. Also, run DO and BOD tests on River above and below outfall once per week.

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PREPARED BY: Robert Harp and Larry Walz

ATTACHMENT #2

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

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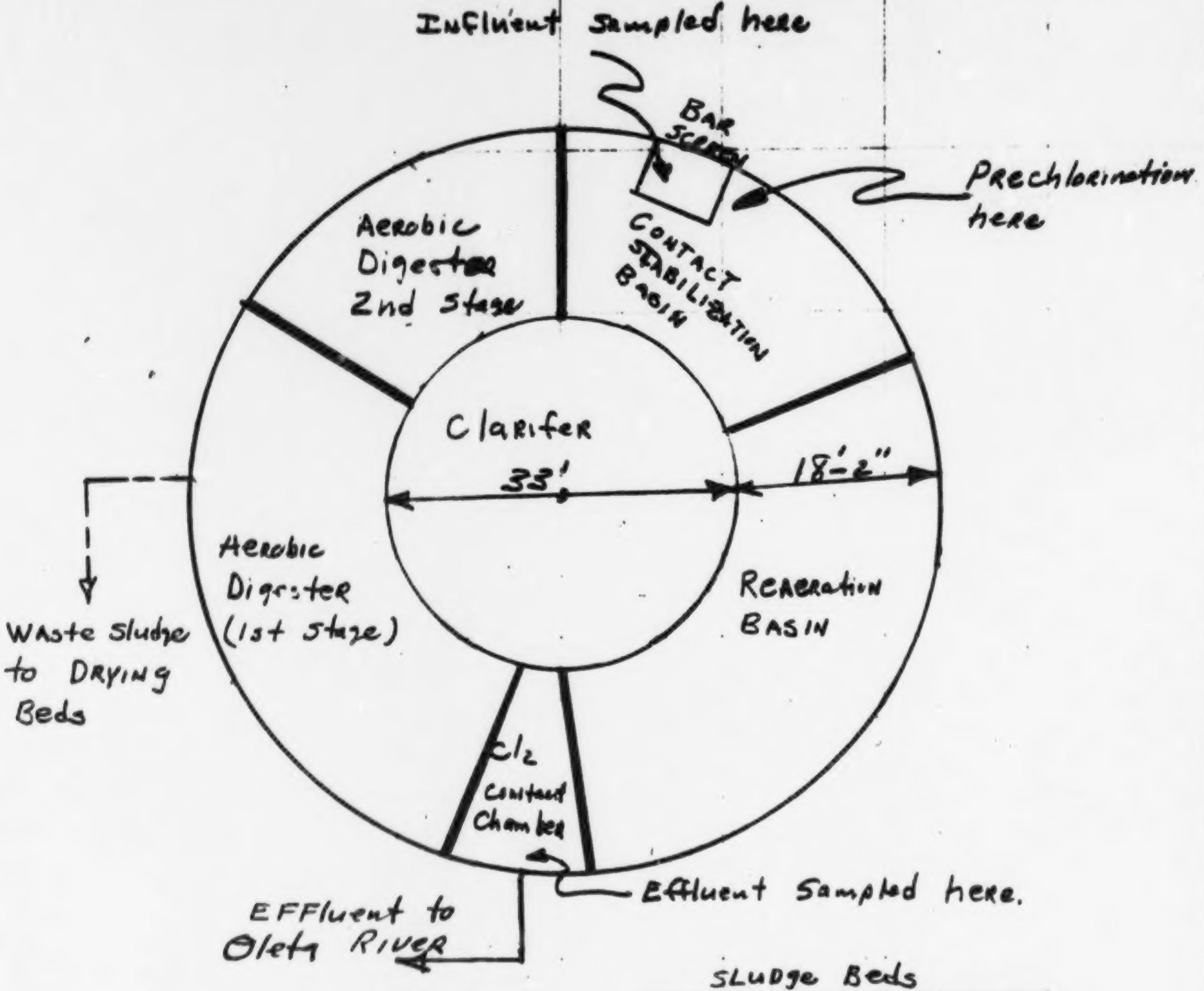
PLANT Golden Isles

DATE ON		17 Jan. 71	18 Jan. 71	19 Jan. 71	20 Jan. 71	21 Jan. 71	AVERAGE
TIME ON		0750	0750	0750	0750	0750	
DATE OFF		18 Jan 71	19 Jan. 71	20 Jan 71	21 Jan. 71	22 Jan. 71	
TIME OFF		0750	0750	0750	0750	0750	
FLOW	START	8265760	8272129	8278758	8285206	8291759	
	END	8272129	8278758	8285206	8291759	8297859	
	TOTAL X 100	6369	6629	6448	6553	6100	
	24 hr. Flow Rate	636900	662,900	644,800	655,300	610,000	641,980
INF.	TEMP. ON	25.4	25.4	23.6	24	24.6	24.6
	PH - ON	6.8	7.4	7.0	7.7	7.1	7.2
EFFLUENT	TEMP - ON	24.6	25.3	23	21	23.8	23.5
	PH - ON	7.4	6.4	6.5	6.3	5.7	6.5
	Cl. Residual	>2.5	>2.5	<0.1	1.5	>5.0	>2.3
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
18 Jan. 71	Normal	Normal	O.K.	
19 Jan. 71	Normal	Normal	O.K.	
20 Jan. 71	Normal	Normal except chlorinator not working between ≈ 0830 - 1000, 20 Jan. 71	O.K.	
21 Jan. 71	Eff - #9, 10 - settable solids, 11 - light solids		#1 tripped @ 0830 O.K.	
22 Jan. 71	Peculiar odor around plant - origin unknown - possible deodorant.	Normal	O.K.	

Figure 1. Golden Isles Utilitie
Wastewater Treatment Plant
Schematic Diagram

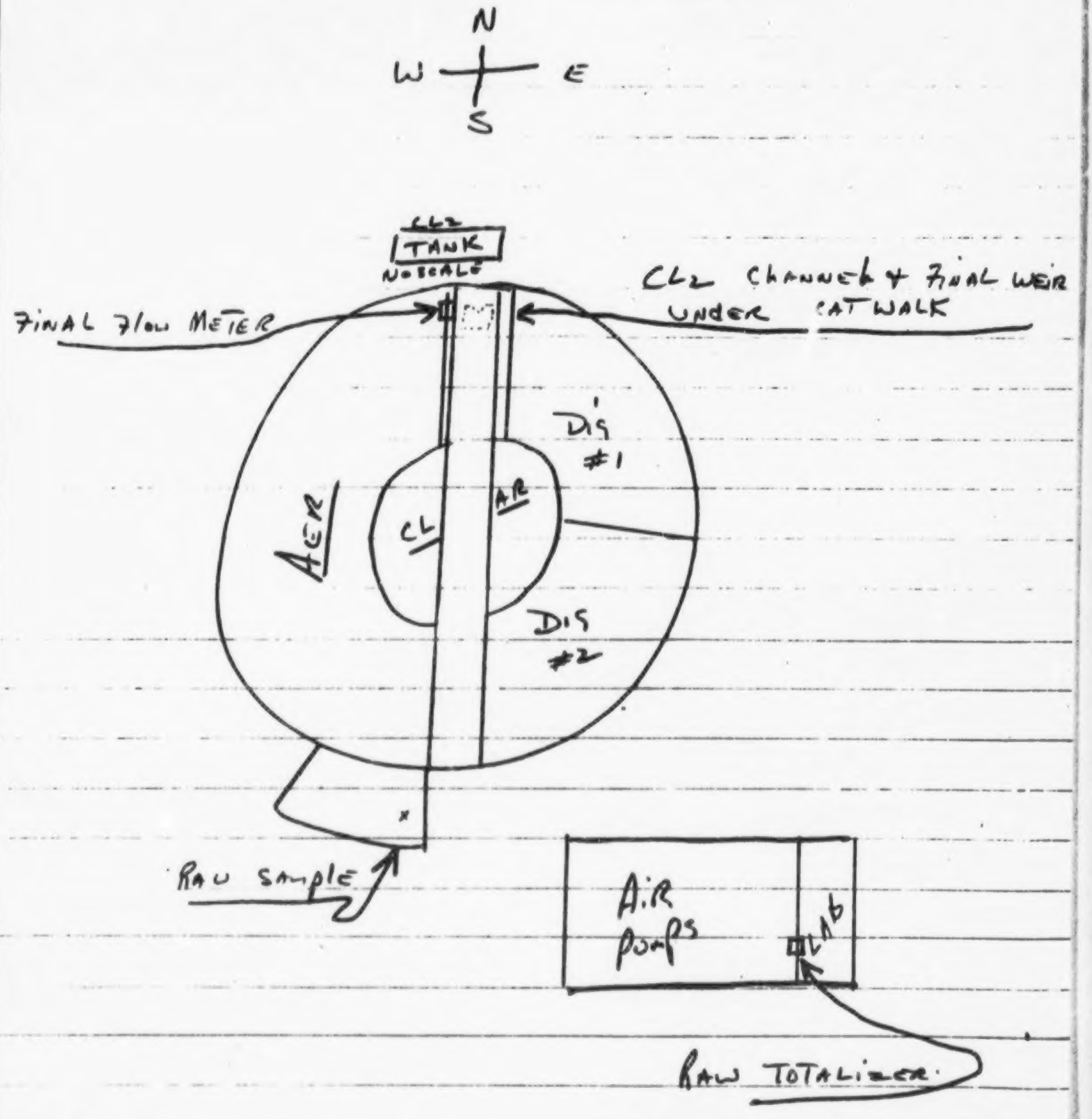

Influent sampled here
BAR SCREEN
Prechlorination here
CONTACT STABILIZATION BASIN
Aerobic Digester 2nd Stage
Clarifer
33'
18'-2"
Aerobic Digester (1st stage)
Reaeration BASIN
Waste sludge to DRYING Beds
Cl_2 Contact Chamber
Effluent sampled here.
EFFluent to Oleta RIVER

Unit Process	Volume (FT³)	Depth (FT)
Settling tank	9,950	11.25
CONTACT BASIN	8,520	15.0
REAERATION "	17,200	15.0
1ST Stage DIGESTER	11,360	15.0
2nd " "	5,680	15.0
Chlorine Contact Chamber	1,550	13.75

SLUDGE Beds
CONSTRUCTED 1970

Golden Isles
2459 N.E. 204 ST.
Brown - Op. - B
Design cap 0.5 MGD
Contact stabilization

	RAW	FINAL
5 day BOD about	85.0 TO 262.5	97 %
Total solids about	750	22 TO 74


N
W
E
S
CL2
TANK
NO SCALE
Final Flow Meter
CL2 Channel & Final Weir under catwalk
Dig #1
AIR
CL
AER
Dig #2
Raw sample
Air pumps
Lab
Raw Totalizer

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Golden Isles

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE
FLOW - MGD							
5 DAY BOD mg/l	INFLUENT	214	156	186	169	187	182
	EFFLUENT	30	22	31	47	29	32
	IN - OUT						☒
	% REMOVAL	86.0	85.9	83.3	72.2	84.5	82.4
	LOAD-lbs/day						
COD mg/l	INFLUENT	755	449	475	697	350	545
	EFFLUENT	110	92	81	149	86	103
	IN - OUT						☒
	% REMOVAL	85.4	79.5	82.9	78.6	75.4	80.4
	LOAD -lbs/day						
TSS mg/l	INFLUENT	238	148	184	136	204	182
	EFFLUENT	23	6	12	95	21	31
	IN - OUT						☒
	% REMOVAL	90.3	95.9	93.5	30.1	89.7	79.9
	LOAD- lbs/day						
VSS mg/l	INFLUENT	186	132	160	120	188	157
	EFFLUENT	22	4	10	90	13	28
	IN - OUT						☒
	% REMOVAL	88.2	97.0	93.8	25.0	93.1	79.4
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	13	7	9	11	10	10
	EFFLUENT	0.0	0.0	0.0	5	0.0	1
	IN - OUT						☒
	% REMOVAL	100	100	100	54.5	100	90.9
TOC mg/l	INFLUENT	[illegible]	100	145	95	100	112
	EFFLUENT	[illegible]	20	25	31	28	25
	IN - OUT	99					☒
	% REMOVAL	82.5	80.0	82.8	67.4	72.0	77.7
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Golden Isles

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	23.0	25.0	23.1	26.3	22.6	24.0
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	21.6	24.8	20.5	20.0	20.0	21.4
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	1.4	0.2	2.6	6.3	2.6	2.6
	LOAD-lbs/day						
NO_2 -NO_3 as N	CONC.-mg/l	2.05	0.04	0.02	0.2	0.08	.08
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	15.0	10.4	8.6	10.0	11.5	11.1
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	124	123	105	96	123	114
TOTAL COLIFORM	CONC - MPN/100ml	45	<18	3,500,000	<18	<18	<18
Fecal COLIFORM	CONC - MPN/100ml	<18	<18	1,300,000	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from
Homestead Air Force Base Waste Water Treatment Plant
Homestead Air Force Base
Homestead, Dade County, Florida
March 17, 1971

INTRODUCTION

The Homestead Air Force Base Waste Water Treatment Plant was surveyed during the period January 10 - 15, 1971. The plant is a trickling filter system, with effluent flowing to the Military Canal. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent after chlorination. Daily grab samples for temperature, pH, chlorine residual, and total and fecal coliform were also collected. Messrs. Terry Davis and Joe Hopson were the sample collectors. Primary contact was Captain Jack Sweeney, of the Civil Engineering Office, Homestead Air Force Base.

SUMMARY AND CONCLUSIONS

The plant was hydraulically over loaded during the study period. The average flow was 2.12 MGD and the design flow is 1.15 MGD. The average influent and effluent five-day biochemical oxygen demand (BOD) were 52 and 18 mg/l, respectively. The average influent and effluent total suspended solids concentrations were 69 and 38 mg/l, respectively. The loads discharged by the plant were 318 lbs per day of BOD, and 631 lbs per day of total suspended solids. The effluent was insufficiently chlorinated (<0.5 mg/l) on three days of the five days that samples were collected.

This plant did not provide 90% treatment of BOD or total suspended solids. The average BOD removal efficiency was 63.7% and the average removal efficiency for total suspended solids was 76%.

The average loadings and removal efficiencies were calculated from the daily values.

INVENTORY

Major components are:

1. Three-cell primary clarifier, designed for a capacity of 1.15 MGD.
2. Two high rate trickling filters, designed for a total capacity of 2.4 MGD.
3. Three-cell secondary clarifier, designed for a capacity of 1.15 MGD.
4. Chlorine contact chamber.

RESULTS

The average flow during this study period was 2.12 MGD, which is 185% of the 1.15 MGD design flow.

The average influent BOD concentration was 52 mg/l and the average effluent concentration was 18 mg/l (318 lbs per day). BOD removal efficiency ranged from 39 to 78.5% and averaged 63.7%. The total suspended solids influent and effluent concentrations were 69 and 38 mg/l, respectively. The average total suspended solids removal efficiency was 76%.

The effluent of the plant was highly nitrified. The average nitrite-nitrate nitrogen effluent concentrations was 6.8 mg/1 (119 lbs per day). The average concentrations of ammonia and organic nitrogen discharges were 2.0 and 1.5 mg/1, respectively. An average of 119 lbs per day of total phosphorus was discharged at an average concentration of 6.9 mg/1.

The chlorine residual was less than 0.5 mg/1 on three of the five days that the plant was sampled.

All data collected is presented in the attached Field and Data Summary Sheets.

DISCUSSION

The visual appearance of and "housekeeping" at the plant are excellent. However, closer inspection reveals less than desirable operating conditions. On January 10, 1971, the first day of the survey, there was no flow into the plant. Captain Sweeney informed us that the main lift station had gone out of operation on the evening of January 9. The primary and secondary clarifiers appeared septic, and it is probable that there was damage to the biota in the trickling filters. The lift station apparently had caused problems on several occasions during the month of December 1970.

The most serious problem is hydraulic overloading. Average flow during the survey period was 2.12 MGD, and Captain Sweeney stated that the average flow during the summer months was 3.25 MGD. The installation is well aware of the infiltration into the collection system, and is taking some steps to correct the situation. However, they feel the primary problem is during the summer period. Review of the laboratory data shows a highly diluted influent, which is corroborated by visual appearance, and suggests a serious problem even during winter months. The infiltration problem is most pressing and an accelerated effort should be made to correct the situation.

At present, the influent is chlorinated prior to flow into both the primary and secondary clarifiers, as an odor control measure. While probably not harmful, it seems unnecessary, with the isolated location of the plant.

Laboratory procedures at the plant are unsatisfactory. Samples are composited over eight hours, but operating procedures are changed during the sampling period. Prechlorination lines were shut down during the period. During the survey period an Air Force Bio-Engineering team was conducting sampling and testing at the plant, and discovered discrepancies in the temperature of the incubator used for BOD samples. We recommend review of laboratory procedures and further training for the operator.

Another general problem is a lack of personnel. One operator is on full time duty, and is required to maintain plant operation as well as perform all laboratory analyses. It is recommended that the installation review personnel requirements for plant operation, as well as future plans for expansion. The plant design should be reviewed to ensure adequacy of removal efficiences.

Funds have been allocated for enlargement of plant facilities to a capacity of 2.4 MGD. The modification consists of construction of new primary clarifiers, and conversion of existing primaries to secondary clarifiers, with continued use of existing trickling filters, and the addition of sand filters.

LAWRENCE W. OLINGER

ROBERT L. KING

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 26, 1971

PLANT NAME: Homestead Air Force Base

PLANT OWNER: Homestead Air Force Base

ADDRESS Homestead, Florida

TELEPHONE

COLLECTION SYSTEM – TYPE: Separate

OWNER: Same

ADDRESS:

TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 1.15 MGD YEAR COMPLETED: 1956 Revised - 1969

STREAM FLOW cfs | DURATION days FREQUENCY Yrs

CONSTRUCTION COST

POPULATION SERVED 14,000

OPERATION ANNUAL COST

PERSONNEL 1 operator plus part-time help for mechanical maintenance & lift stations

LEVEL OF CERTIFICATION None

CONDITION OF EQUIPMENT Fair

OUTFALL TYPE Submerged SIZE LENGTH

DISCHARGED TO: Military Canal WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Primary Clarifier, Trickling Filter, Secondary Clarifier, Chlorine Contact Chamber

SLUDGE TREATMENT Two-stage anaerobic

DISPOSAL Sludge Drying Beds

REMARKS

EPARED BY: R. L. King

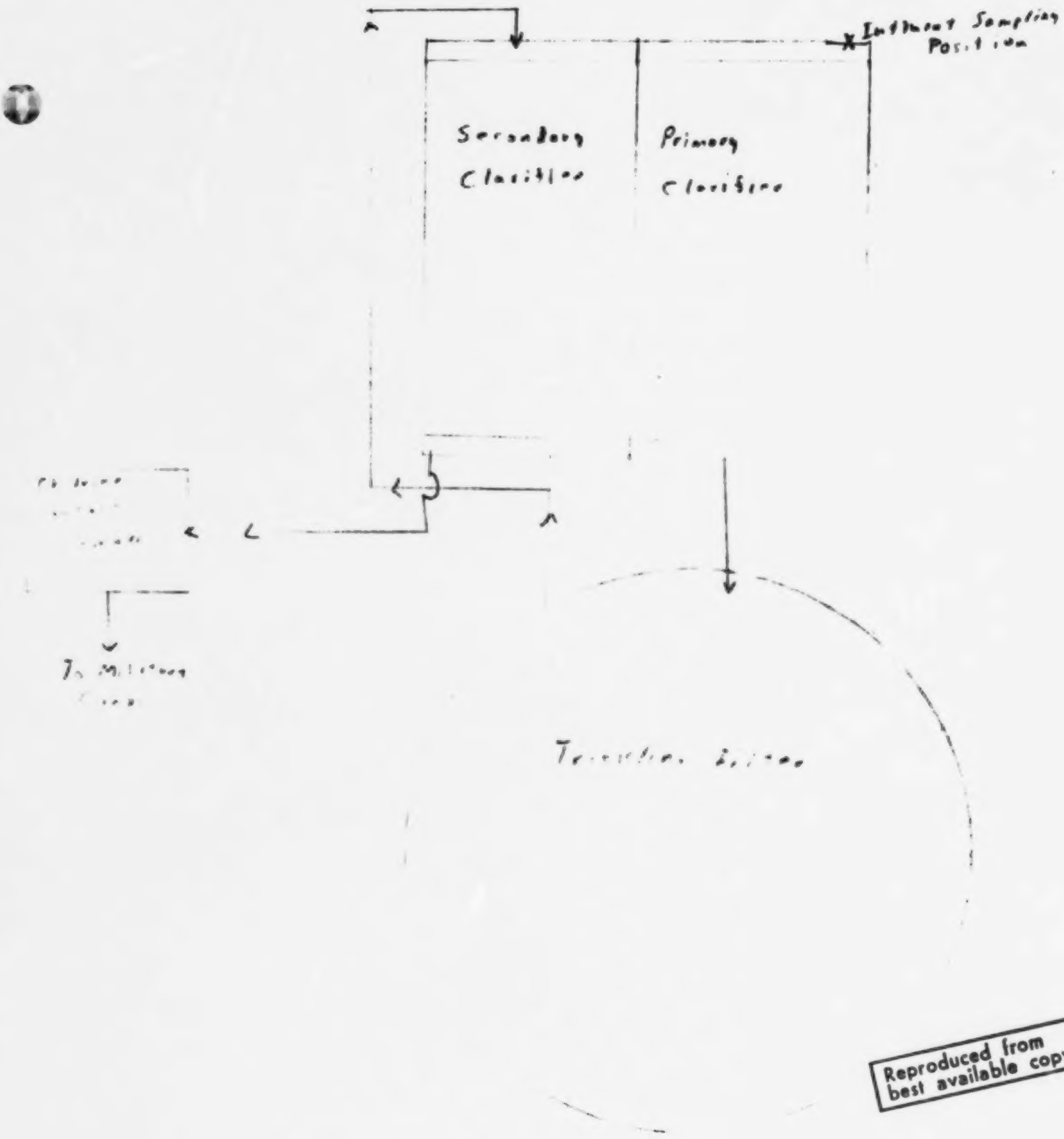
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Homestead AFB

DATE ON		1-10-71	11 Jan, 71	12 Jan, 71	13 Jan, 71	14 Jan, 71	AVERAGE
TIME ON		815	0815	0815	0815	0815	
DATE OFF		11 Jan 71	12 Jan, 71	13 Jan, 71	14 Jan, 71	15 Jan, 71	
TIME OFF		8:15	0815	0815	0815	0815	
FLOW	START	1253070	1254973	1256876	1259102	1261370	
	END	1254973	1256876	1259102	1261370	1263654	
	TOTAL X 1000	1903	1903	2226	2268	2284	
	24 hr. Flow Rate	1903	1903	2226	2268	2284	2,116,800
INF.	TEMP. ON	26.5	25	25	25	24.8	25.8
	PH - ON	7.2	7.2	7.4	7.1	7.0	7.2
EFFLUENT	TEMP - ON	25.5	26	25	25	25.4	25.4
	PH - ON	7.0	6.9	7.0	6.8	6.8	6.9
	Cl. Residual	1.5	.25	.25	.25	.5	.55
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
11 Jan 71	Influent looked dilute	Trickle filter arms stopped due to zero flow	2,22,8 Inf Bt. Blk	
12 Jan 71	Normal	water over skimmer in primary. Turned off pre Cl @ 0800	Eff-#10-black Inf #22 #6 black	
13 Jan	Normal	Normal	Inf-#22-black	
14 Jan	Normal	Normal	Eff - 2-7 black clock stopped Inf-#22 black	
15 Jan	Normal	Normal	Inf #22 black	

Homestead Air Force Base


Influent Sampling Position
Secondary Clarifier
Primary Clarifier
Chlorine Contact Chamber
To Military Canal
Trickling Filter

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Sheet ___of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Homestead AFB

DATE - OFF		1/11	1/12	1/13	1/14	1/15	AVERAGE
FLOW - MGD		1.903	1.903	2.226	2.268	2.284	2.117
5 DAY B O D mg/l	INFLUENT	49	43.5	41	64	61	52
	EFFLUENT	16	14.5	25	21	13.1	18
	IN - OUT						
	% REMOVAL	67.3	66.7	39.0	67.2	78.5	63.7
	LOAD-lbs/day	253	230	464	397	249	318
C O D mg/l	INFLUENT	574	627	190	543	295	446
	EFFLUENT	75	68	55	51	51	60
	IN - OUT						
	% REMOVAL	86.9	89.2	71.1	90.6	82.7	84.1
	LOAD -lbs/day	1190	1079	1021	964	971	1045
T S S mg/l	INFLUENT	[illegible] *	108	58	74	52	67
	EFFLUENT	[illegible]	36	18	12	8	38
	IN - OUT						
	% REMOVAL	N/A	66.7	69.0	83.8	84.6	76.0
	LOAD- lbs/day	1672	571	334	226	152	631
V S S mg/l	INFLUENT	[illegible] *	104	48	62	48	62
	EFFLUENT	92	8	12	8	5	25
	IN - OUT						
	% REMOVAL	N/A	92.3	75	87.1	89.6	86.0
	LOAD –lbs/day	1460	126	222	151	95	410
Settlable Solids ml/l	INFLUENT	2	4	2.5	3.5	3	3.0
	EFFLUENT	.2	.2	.1	.2	.2	.2
	IN - OUT						
	% REMOVAL	90	95	96	94.3	93.3	93.7
T O C mg/l	INFLUENT	34	55	60	33	40	44
	EFFLUENT	24	26	10	13	17	18
	IN - OUT						
	% REMOVAL	29.4	52.7	83.3	60.6	57.5	56.7
	LOAD - lbs/day	380	412	185	245	323	309

INFLUENT BOD POPULATION EQUIVALENT =________

EFFLUENT BOD POPULATION EQUIVALENT =________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* Field sampler reported possible sample label mixup on BOD sample.

Released
From The Desk Of
Michael V. Polito MVP

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Sheet____ of_______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Homestead AFB

DATE - OFF		1/11	1/12 ✓	1/13	1/14	1/15	AVERAGE or MEDIAN*
FLOW - MGD		1.903	1.903	2.226	2.268	2.284	2.117
KTELDAHL NITROGEN as N	CONC.-mg/l	4.1	3.9	3.1	1.8	4.5	3.5
	LOAD-lbs/day	65	61	57	34	85	60
AMMONIA NITROGEN as N	CONC.-mg/l	1.8	1.9	2.4	0.8	3.0	2.0
	LOAD-lbs/day	28	30	44	15	57	34
ORGANIC NITROGEN as N	CONC.-mg/l	2.3	2.0	0.7	1.0	1.5	1.5
	LOAD-lbs/day	36	31	12	19	29	25
NO_2 -NO_3 as N	CONC.-mg/l	6.8	7.0	6.4	7.2	6.5	6.8
	LOAD-lbs/day	107	111	118	136	123	119
TOTAL PHOSPHORUS AS P	CONC.-mg/l	7.9	8.0	6.1	6.8	5.6	6.9
	LOAD-lbs/day	125	126	113	128	106	119
CHLORIDE	CONC.-mg/l	100	99	201	239	313	190
TOTAL COLIFORM	CONC.-MPN/100ml	3300	<18	170	230	<18	170
Fecal COLIFORM	CONC.-MPN/100ml	45	<18	45	45	<18	45

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from
Leisure City Waste Water Treatment Plant
Owned by Rex Utilities, Inc.
1522 Harding Lane
Leisure City, Dade County, Florida
February 12, 1971

INTRODUCTION

The Leisure City Waste Water Treatment Plant was surveyed during the period January 3 - 8, 1971. The plant is a contact stabilization unit with final effluent flowing into a sand filter. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent after chlorination. Daily grab samples were taken after chlorination, for chlorine residual, temperature, pH, and total and fecal coliform. Messrs. Terry Davis and Joe Hopson were sample collectors. Primary contacts were Messrs. Ray Coberly of Rex Utilities, and Robert Cuevas of Greenleaf/Telesca, Engineers and Architects.

SUMMARY AND CONCLUSIONS

An average flow through the Leisure City Waste Water Treatment Plant of 0.296 MGD was measured during the study. Calculations of average removal efficiencies do not include samples taken on January 5, 1971, since these samples were taken during a period when the plant was malfunctioning. However, this condition was considered in the overall evaluation of plant performance. The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 237.8 and 31.3 mg/1, respectively. An average

BOD_5 of 76 lbs. per day was discharged to the sand filter and subsequently to ground water. The average influent total suspended solids concentration was 437 mg/l and an average loading of 175 lbs. per day was discharged at an average concentration of 73.3 mg/l. The effluent was consistently and effectively chlorinated on all four days where grab samples were taken.

The plant does not meet the proposed State of Florida performance criteria of 90% treatment. On January 5, 1971, the BOD_5 and total suspended solids removal efficiency was negative, with a higher BOD_5 and suspended solids concentration recorded in the effluent than in the influent for that sampling period. On the remaining days the average BOD_5 removal efficiency was 86.8% and that for total suspended solids was 81.2%. The average removal efficiency was calculated from the daily removal efficiencies, excluding the efficiency for January 5, 1971.

The following are recommended to improve plant operations:

1. Design of the plant should be reviewed and updated to accomplish 90% removal of BOD_5.

2. Mechanical maintenance be improved to reduce down-time of the secondary clarifier.

3. Review of staffing requirements be made to ensure adequate personnel for proper supervision and mechanical maintenance of the plant.

4. Modification be made in the operation of the clarifiers to increase the removal of solids, or the installation of additional devices to reduce solids in the plant effluent.

INVENTORY

The plant is designed for an average flow of 0.63 MGD. Major components of the plant are as follows:

1. Comminutor with bar rack.
2. Mixing tank, designed for a detention time of 2.5 hours.
3. Reaeration tank, designed for a detention time of 5.2 hours.
4. Three secondary clarifiers, designed for a detention time of 2.7 hours, with sludge return to the reaeration tank.
5. Chlorine contact tank, designed for a detention time of 61.5 minutes.
6. Six sand filters (area of 14,000 square feet each) with flow to ground water.

DISCUSSION OF RESULTS

The average flow during the study period was 0.296 MGD, which is well under the 0.63 MDG design flow for this plant. The average total chlorine residual during the study was 2.3 mg/l and disinfection of the effluent was effective.

The pollutional strength of the discharge and the efficiency of the plant were determined by the five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD) and the total organic carbon (TOC) tests, with performance on January 5, 1971 excluded from calculation of the average. The average BOD_5 of the effluent was 31.3 mg/l and an average of 76 lbs.

per day was discharged to the sand filter and subsequently to ground water. The removal efficiencies of BOD_5 varied from 85.1% to 88.0% for an average of 86.8%, under normal plant operation. This consistent removal efficiency indicates a need for redesign of the plant to accomplish the required 90% removal efficiency. The average removals of COD and TOC were 87.1% and 80.8%, respectively.

The average removal of total suspended solids (TSS) was 81.2%, with the exception of January 5, 1971, where a higher concentration of suspended solids was observed in the effluent than in the influent. The visual appearance of the effluent confirms the fact that the labeling of the samples was not mixed, nor were analyses reported incorrectly. The average quantity of TSS in the effluent was 73.3 mg/l or 175 lbs. per day. The plant is efficient in removing settleable solids since an average of 98.3% was removed.

Significant quantities of nutrients are discharged by this plant, in all forms of nitrogen except nitrite-nitrate.

Daily values of the data collected during this study are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

General appearance, "housekeeping" and mechanical maintenance were fair during the survey. Visual appearance of the effluent was poor during the first two days of the survey, but improved somewhat as the survey progressed. This is reflected in the values for both BOD_5 and total suspended solids. Laboratory analyses can be correlated with the operational problems observed during the survey. A visual inspection of the clarifiers on January 4, 1971, indicated that the north clarifier appeared to be septic, with some solids carry-over. Upon my arrival at the plant on January 5, 1971, this clarifier was out of operation and I was informed by the operator that a pump had been out of commission, causing heavy sludge carry-over. The pump was repaired and the clarifier placed in operation during the operating period on January 5. On January 6, the clarifier was operating properly, with no solids carry-over. The operator indicated that he had been unaware of any problem until January 5, but my own inspection revealed evidence of the problem on January 4. In my opinion the problem could have been averted by closer observation of plant operation by the operator.

The primary problem in this plant appears to be a shortage of personnel. The plant has one operator who functions as plant supervisor, plus three laborers, with no second or third operating shift. This extra workload does not allow the operator to fully supervise operation of the plant, thereby causing an apparent lack of control over plant operation. I would recommend the addition of operating personnel, since I feel that the problem on January 5, 1971, could have been averted had the chief operator had time to adequately supervise plant operations.

ROBERT L. KING

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Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 12, 1971
PLANT NAME: Leisure City - Kings Highway and Naranja Rd.
PLANT OWNER: Rex Utilities, Inc.
ADDRESS: 1522 Harding Lane, Leisure City, Florida
TELEPHONE:
COLLECTION SYSTEM – TYPE: Separate.
OWNER: Same
ADDRESS:
TELEPHONE:

DESIGN AVERAGE DESIGN FLOW: 0.63 MGD YEAR COMPLETED: 1969
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED 9,000

OPERATION ANNUAL COST No data.
PERSONNEL Operator and three laborers.
LEVEL OF CERTIFICATION "C"
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE Sand filter. SIZE LENGTH
DISCHARGED TO: Subsurface WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Barminutor, contact stabilization unit, secondary clarifiers, chlorine contact chamber, sand filters.

SLUDGE TREATMENT Two stage aerobic digesters, then to sludge beds.
DISPOSAL To dump.

REMARKS

ARED BY: Robert L. King

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT: Leisure City

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES

PREPARED BY: Robert L. King

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Leisure City (Rex)

DATE - OFF		1-4-71	1-5-71	1-6-71	1-7-71	1-8-71	AVERAGE *
FLOW - MGD		0.244	0.295	0.310	0.316	0.318	.296
5 DAY BOD mg/l	INFLUENT	248	243	275	233	190	237.8
	EFFLUENT	37	555	33	29	26	31.3
	IN - OUT	211		242	204	164	
	% REMOVAL	85.1	0	88.0	87.6	86.3	86.8
	LOAD-lbs/day	75		85	76	69	76
COD mg/l	INFLUENT	789	1,023	724	724	665	785
	EFFLUENT	70	2,278	92	85	123	92.5
	IN - OUT	719	—	632	639		
	% REMOVAL	91.1	—	87.3	88.3	81.5	87.1
	LOAD -lbs/day	142		238	224	326	233
TSS mg/l	INFLUENT	440	640	472	280	352	437
	EFFLUENT	120	980	60	45	68	73.3
	IN - OUT	320	—	412	235	284	
	% REMOVAL	72.7		87.3	83.9	80.7	81.2
	LOAD- lbs/day	244		155	119	180	175
VSS mg/l	INFLUENT	428	624	412	276	324	413
	EFFLUENT	110	920	58	42	72	70.5
	IN - OUT	318	—	354	234	252	
	% REMOVAL	74.3		85.9	84.8	77.8	80.7
	LOAD –lbs/day	224		150	111	191	169
Settlable Solids ml/l	INFLUENT	12	9	8	4	12	9.0
	EFFLUENT	.2	>40	0.0	.1	0.3	0.15
	IN - OUT	11.8	—	8.0	3.9	11.7	
	% REMOVAL	98.3		100	97.5	97.5	98.5
TOC mg/l	INFLUENT	153	138	208	165	150	163
	EFFLUENT	26	460.0	28.0	50	24	32
	IN - OUT	127	—	180	115	126	
	% REMOVAL	83.0		86.5	69.7	84.0	80.8
	LOAD · lbs/day	53		72	132	64	80

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* Effluent data for 1/5/71 not included in average

Released
From The Desk Of
Michael V. Polito

Sheet 4 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

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PLANT Leisure City

DATE - OFF		1/4/71	1/5	1/6	1/7	1/8	AVERAGE or MEDIAN*
FLOW - MGD		0.244	0.295	0.310	0.316	0.318	0.296
KTELDAHL NITROGEN as N	CONC.-mg/l	9.1	154.6	15.9	19.4	17.8	43.4
	LOAD-lbs/day	19	380	41	51	47	108
AMMONIA NITROGEN as N	CONC.-mg/l	6.6	13.6	12.2	16.8	16.2	13.1
	LOAD-lbs/day	13	33	32	44	43	33
ORGANIC NITROGEN as N	CONC.-mg/l	2.5	141.0	3.7	2.6	1.6	303
	LOAD-lbs/day	5	347	10	7	4	75
NO_2 - NO_3 as N	CONC.-mg/l	2.1	1.0	0.2	0.2	0.2	0.7
	LOAD-lbs/day	4	2	1	1	1	2
TOTAL PHOSPHORUS AS P	CONC.-mg/l	12.0	59.2	9.2	10.2	8.5	19.8
	LOAD-lbs/day	24	146	24	27	23	49
CHLORIDE	CONC.-mg/l	53	46	59	56	52	
TOTAL COLIFORM	CONC - MPN/100ml	20	78		20	40	30
Fecal COLIFORM	CONC - MPN/100ml	<18	<18		<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

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PLANT Leisure City (Rex)

DATE ON		3 Jan, 71	4 Jan, 71	5 JAN 71	6 Jan, 71	7 Jan, 71	AVERAGE
TIME ON		0800	0840	10.10	0924	0930	
DATE OFF		4 Jan, 71	5 Jan 71	6 Jan, 71	7 Jan, 71	8 Jan, 71	
TIME OFF		0840	1010	0924	0930	0900	
FLOW	START	120886	121137	121450	121750'	122067	
	END	121137	121450^{3}	121750	122067^{3}	122378	
	TOTAL x 1000	251	313	300	317	311	
	24 hr. Flow Rate	243,890	294588	310,344	315,684	317,618	296,425
INF.	TEMP. ON	25°	26°	25	26	25	25.2
	PH - ON	7.0	6.9	7.1	7.0	7.3	7.1
EFFLUENT	TEMP - ON	24°	24.5°	24.5	25	25	24.6
	PH - ON	7.	6.9	7.0	7.2	7.3	7.1
	Cl. Residual	>2.5	1.4	2.5	>2.5	2.5	2.3
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
3 Jan, 71	Normal	Normal	—	
4 Jan, 71	Normal	Normal over-	Eff-2, 7, 10 13, 16, 19, 22- blank	
5 JAN 71	HEAVY SEDIMENT in effluent	North SECONDARY CLARIFIER Down on ARRIVAL. Used all Sample collected as composit.	Clock Malfunction on Eff. #1, 2, 3, 4, 5, 6, 7, 8, 22, 23, 24 replaced clock	~~over~~
6 Jan, 71	Eff had fine suspended material-	North clarifier OK slight flock in other of two.	Inf - ~~[illegible]~~ empty due to clock running slow	over
7 Jan.	Same as above	Same as above	Inf-#5, 6, 8 18-blank	
8 Jan	Same as above	Flock in clarifiers	Inf-#4, 18 & 20 blank	

Lower Florida Estuary Study
Report on Water Borne Wastes from Little Abner's Trailer Park Waste Water Treatment Plant

11185 West Flagler Street
Miami, Dade County, Florida
February 12, 1971

INTRODUCTION

The Little Abner's Trailer Park Waste Water Treatment Plant was surveyed during the period December 6 - 11, 1970. The plant is a Davco contact stabilization unit, with a polishing pond. Final effluent flows into Snapper Creek. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent. Daily grab samples for chlorine residual, total and fecal coliform, temperature and pH were also collected. The effluent was sampled from a wet well after the polishing pond. Messrs. Terry Davis and George Egermier were sample collectors. Primary contacts were Mr. Russell Kuntzman, Maintenance Supervisor, and Mr. B. A. McAdams, Consulting Engineer.

SUMMARY AND CONCLUSIONS

The average flow through the Little Abner's Trailer Park Waste Water Treatment Plant was 0.072 MGD and the design flow is 0.150 MGD.

The influent five-day biochemical oxygen demand (BOD_5) averaged >402 mg/l, and an average of 32 lbs. per day of BOD_5 were discharged to

Snapper Creek at an average concentration of 52 mg/l. The average total suspended solids concentration in the influent was 350 mg/l and that in the effluent was 80 mg/l.

The total and fecal coliform concentrations observed in the plant effluent line were 130 and <18 mg/l respectively.

This plant does not meet the proposed State of Florida performance criteria of 90% treatment. The average removal efficiencies were $>84.1\%$ for BOD_5 and 79.1% for total suspended solids.

The following are recommended to improve the operation of this plant:

1. The operating procedure should be modified to consider the higher than anticipated BOD_5 and total suspended solids concentrations in the influent.

2. The foam problem in the plant should be reduced by water spray and the practice of preventing foaming by maintaining a lower than normal mixed liquor suspended solids ratio in the aeration tank should be terminated.

3. The plant operators should apply for certification.

INVENTORY

In the present operating configuration the two major components are:

1. The Davco unit, which is a circular tank. The inner compartment functions as a secondary clarifier. The outer annular compartmented

ring consists of the contact zone, the reaeration zone, the aerobic digester, and the chlorine contact chamber. The plant is designed for a flow of 150,000 gallons per day with 90% removal of BOD and suspended solids at an influent concentration of 200 ppm each.

2. A small polishing pond.
3. An outfall to Snapper Creek in which chlorination occurs.

DISCUSSION OF RESULTS

Flow during the study period ranged from 0.01 MGD to 0.104 MGD and averaged 0.072 MGD. Plant records for August through November 1970 indicate that the flow variation encountered during the study is not uncommon.

The average BOD_5 concentration in the influent was >402 mg/l and that in the effluent was 52 mg/l. The average BOD_5 removal efficiency for this plant was >84.1%, but could not have exceeded an average of 85%, and 32 lbs. per day were discharged to Snapper Creek. Extremely low removals of chemical oxygen demand (COD), 49.1%, and total organic carbon (TOC), 57.2%, were observed at this plant during the study.

The average influent and effluent total suspended solids concentrations were 350 and 80 mg/l respectively, and the removal efficiency was 79.1%. The settleable solids removal efficiency was 92.2%.

Based on the design data this plant should remove 90% of BOD_5 and suspended solids based on influent concentrations of 200 mg/l for each parameter. Influent concentrations of both parameters were considerably higher than the design criteria, and the flow was lower than the design flow. Therefore, the operating procedure should be modified to incorporate the higher than anticipated influent concentrations.

Significant concentrations of ammonia nitrogen, 19.5 mg/l, organic nitrogen, 7.2 mg/l, and total phosphorus, 15.2 mg/l are discharged from the plant to the Snapper Creek Canal.

The operator of this plant did not inform us of the chlorination in the effluent of the polishing pond until the study was completed. The samples collected during the study were from the point where the chlorine was added, allowing no contact time. On January 15, 1971, grab samples were collected near the end of the outfall line. The fecal and total coliform concentrations found were 130 and $<$18 MPN per 100 ml.

The daily values for all parameters are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF PLANT OPERATION

General appearance of the plant is good. "Housekeeping" is adequate and mechanical maintenance appeared to be sound during the survey period. However, the appearance of effluent from the plant and from the polishing pond was poor. Color was evident and there was visible evidence of either suspended or settleable solids. Copies of laboratory analyses were provided for the months of August through November 1970. These analyses indicate a higher degree of removal than would be expected from visual inspection of the effluent. The mixed liquor suspended solids (MLSS) was maintained lower than recommended in order to reduce the problem of scumming, or heavy foaming. Review of their laboratory analyses indicate that removal efficiencies ranging from 93% to 99% were achieved when using this method of operation. However, our data indicates considerably lower removal efficiencies. Therefore, it is recommended that the plant be operated at normal MLSS ratios, and that the scumming problem be combatted by use of water spray. Further accurate analyses should be made to determine the plant efficiency under more normal operating procedures.

During the survey, we were misinformed regarding the chlorination procedure. Due to this, a bacteriological sample was collected in a manhole downstream from the wet well.

LAWRENCE W. OLINGER

ROBERT L. KING

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

Sheet 1 of 5

DATE OF VISIT: December 9, 1970
PLANT NAME: Little Abner's Trailer Park
PLANT OWNER: Jeab, Inc.
ADDRESS: 400 N.W. 112th Ave.
TELEPHONE:
COLLECTION SYSTEM – TYPE: Same
OWNER:
ADDRESS:
TELEPHONE:

DESIGN AVERAGE DESIGN FLOW: 0.150 MGD YEAR COMPLETED: 1968
STREAM FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST $60,000
POPULATION SERVED 1600 plus: school with 75 students, 7-11 Store, coin laundry, Italian restaurant, cleaners, and beauty parlor.

OPERATION ANNUAL COST $17,000 labor plus unknown quantity of supplies.
PERSONNEL 2 operators and Maintenance Supervisor.
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair

OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Snapper Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Davco plant and oxidation lagoon.

SLUDGE TREATMENT Aerobic digester as part of Davco unit.
DISPOSAL None disposed of at present.

REMARKS

RED BY: Robert L. King

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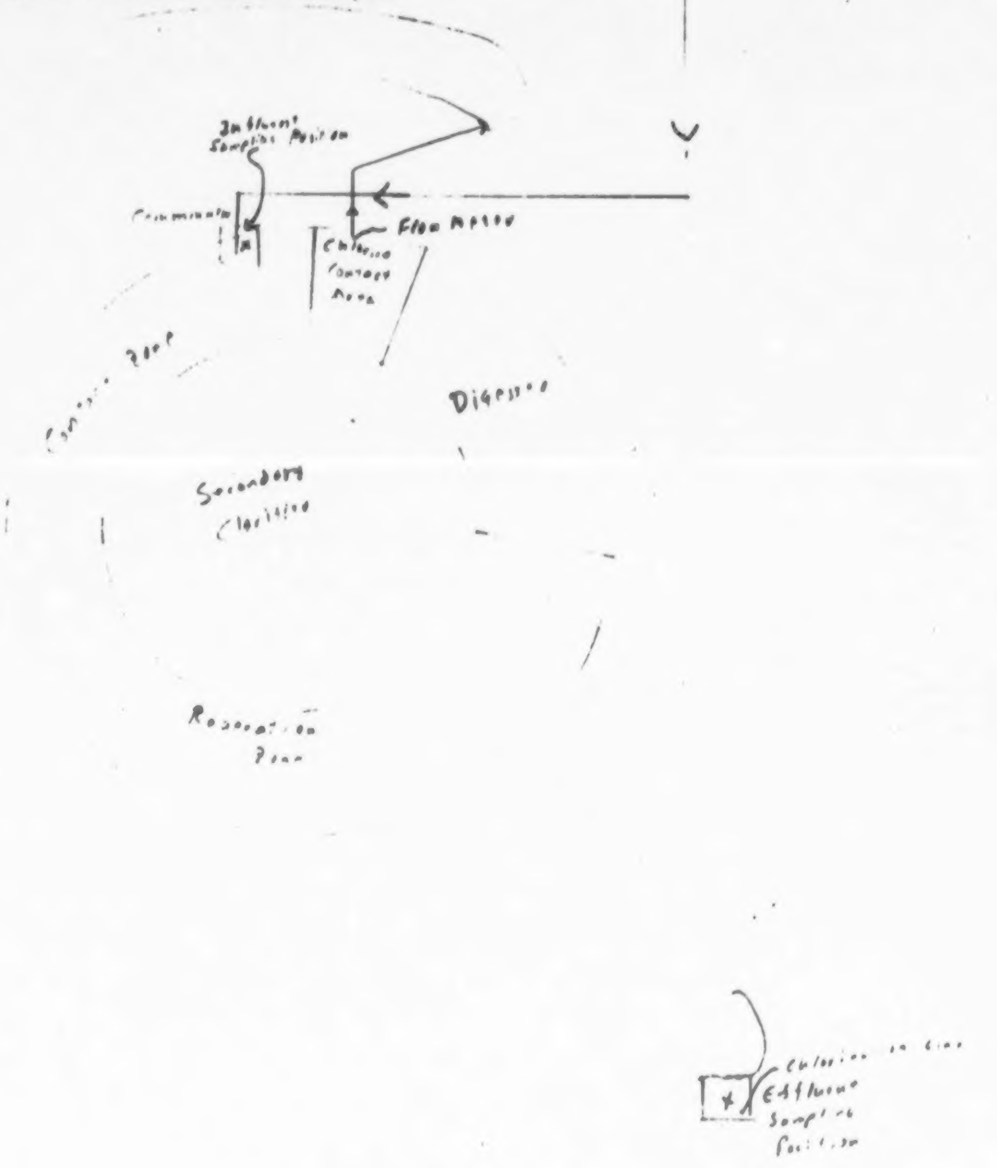
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Little Abner's Trailer Park

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Influent Sampling Position
Comminutor
Flow Meter
Chlorine Contact Tank
Contact Zone
Digester
Secondary Clarifier
Reaeration Zone
Chlorine in line
Effluent Sampling Position

PREPARED BY:

Sheet 3 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT - DATA SUMMARY

PLANT Little Abaco STP

DATE - OFF		12/7/70	12/8/70	12/9/70	12/10/70	12/11/70	AVERAGE
FLOW - MGD		0.01	0.041	0.105	0.103	0.100	0.072
5 DAY BOD mg/l	INFLUENT	274	> 735	438	333	230	> 402
	EFFLUENT	52	40.4	52.7	51.0	64.0	52
	IN - OUT		> 694.6	385.3	282	166	
	% REMOVAL	81	> 94.5	88.0	84.7	72.2	> 84.1
	LOAD-lbs/day	4	14	46	44	53	[illegible]
COD mg/l	INFLUENT	577	1219	791	829	721	831.4
	EFFLUENT	144	607	561	553	493	471.6
	IN - OUT	453		430	276	228	
	% REMOVAL	75.7	50.2	54.4	33.3	31.6	49.1
	LOAD -lbs/day	12	[illegible]	491	475	41	[illegible]
TSS mg/l	INFLUENT	260	320	587	472	112	350
	EFFLUENT	4	170	192	30	12	80
	IN - OUT	256	150		442	100	
	% REMOVAL	98.5	46.9	67.3	93.6	89.2	71.1
	LOAD- lbs/day	0	58	168	26	10	52
VSS mg/l	INFLUENT	224	44	580	132	80	212
	EFFLUENT	6	24	110	10	12	32
	IN - OUT	218	20	470	122	68	
	% REMOVAL	97.3	45.5	81	92.4	85	80.2
	LOAD –lbs/day	1	8	96	9	10	25
Settlable Solids ml/l	INFLUENT	3	24	28	8	6	14
	EFFLUENT	0.1	0.3	1.5	1.0	1.0	0.8
	IN - OUT	2.9	23.7	26.5	7	5	
	% REMOVAL	96.7	98.8	94.6	87.5	83.3	92.2
TOC mg/l	INFLUENT	170	307.5	217.5	185	155	207
	EFFLUENT	94	34	45	80	130	77
	IN - OUT	76	273.5	172.5	105	25	
	% REMOVAL	44.7	[illegible]	79.3	56.8	16.1	57.2
	LOAD - lbs/day	8	12	39	69	108	47

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

Sheet 4 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Little Abner S.T.P.

	DATE - OFF		12/7/70	12/8/70	12/9/70	12/10/70	12/11/70	AVERAGE or MEDIAN*
	FLOW - MGD		0.01	0.041	0.105	0.103	0.100	0.072
	KTELDAHL NITROGEN as N	CONC.-mg/l	24.1	30.8	27.4	29.1	22.1	26.7
		LOAD-lbs/day	2	11	24	25	18	16
	AMMONIA NITROGEN as N	CONC.-mg/l	18.8	20.0	19.4	18.8	20.7	[illegible]
		LOAD-lbs/day	2	7	17	16	17	12
	ORGANIC NITROGEN as N	CONC.-mg/l	5.3	10.8	8.0	10.3	1.4	7.2
		LOAD-lbs/day	0	4	7	9	1	4
	NO_2 - NO_3 as N	CONC.-mg/l	1.0	0.6	0.2	1.0	0.3	.6
		LOAD-lbs/day	0	0	0	1	[illegible]	0
	TOTAL PHOSPHORUS AS P	CONC.-mg/l	13.3	15.7	18.5	16.5	12.0	15.2
		LOAD-lbs/day	1	5	16	14	10	9
	CHLORIDE	CONC.-mg/l	83	80	73	72	89	[illegible]
EFFLUENT	TOTAL COLIFORM	CONC.-MPN/100ml	24,000	3,300	7000	49,000	<18	7000
	Fecal COLIFORM	CONC.-MPN/100ml	460	790	2400	640	<18	640
			1-15-71					
OUTFALL	TOTAL COLIFORM	MPN/100 ml.	130					
	FECAL COLIFORM	MPN/100 ml.	<18					

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

Sheet 5 of 5

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PLANT Little Abner S.T.P.

DATE ON		6 Dec 70	7 Dec 70	8 Dec 70	9 Dec 70	10 Dec 70	AVERAGE
TIME ON		0730	0800	0805	0858	0918	
DATE OFF		7 Dec 70	8 Dec 70	9 Dec 70	10 Dec 70	11 Dec 70	
TIME OFF		0800	0805	0858	0918	0915	
FLOW	START	42150800	42161400	42202600	42311400	42415800	
	END	42161400	42202600	42311400	42415800	42515800	
	TOTAL	10,600	41,200	108800	104,400	100000	
	24 hr. Flow Rate	10,384	41,103	104,300	103,000	100,000	71,877
INF.	TEMP. ON	24.7°C	25.2°C	25.3°C	25.1°C	26.5°C	25.4
	PH - ON	8.42	7.62	8.48	–	~~10.1~~ 6.64	7.8
Polishing Pond EFFLUENT	TEMP - ON	21.5°C	21.9°C	22.4°C	23.3°C	23.1°C	22.4
	PH - ON	6.31	6.62	6.7	–	10.2 6.74	6.6
	Cl. Residual	*0	0	<.25	0/white		
	CHLORINE-ON	–	–	–	–	–	
	CHLORINE-OFF	–	–	–	–	–	
	ON-OFF-lbs	–	–	–	–	–	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
6 Dec 70	Normal	Normal		GAE
GAE				
7 Dec 70	*Eff samples from pond a end of final weir. Pop up abs. breaking up +	NORMAL	Thirteen samples at infl. All composited	GAE
	passing thru wood weir suds observed	PLT. op. said first time he has seen suds in PLT.		GAE
8 Dec 70	Suds in Eff Pit after weir	Skimmer outlet in clarifier under liquid.		GAE
9 Dec 70	Suds + Mesquito larve (live) in pond after final weir	Clarifier + Aerator sides scrubbed down for algae	over	GAE.
10 Dec 70	Suds, insects + larve evident.	NORMAL	OVER	GAE.
11 Dec 70	Very little foam. High level in pond after final weir	NORMAL	OVER	G.AE.

Lower Florida Estuary Study
Report on Waterborne Wastes from Miami Lakes Utilities Waste Water Treatment Plant
14045 N. W. 67th Avenue
Miami Lakes, Dade County, Florida
February 16, 1971

INTRODUCTION

The Miami Lakes Utilities plant was surveyed during the period December 13 - 18, 1970. The plant is a combination of three package treatment units. The combined effluent is discharged to the 138th Street Canal. A Serco automatic sampler was utilized to collect five 24-hour composites of the common effluent, after chlorination; while the Sirco electric automatic sampler was utilized to collect five 24-hour composites of the common influent at the final lift station. Daily grab samples of effluent were taken for chlorine residual, pH, and total and fecal coliform. Messrs. Terry Davis and George Egermier were sample collectors. Principal contacts were Messrs. George Hughes and Robert Gableman, of Miami Lakes Utilities.

SUMMARY AND CONCLUSIONS

The average flow during this study was 0.727 MGD, well under the design flow of 0.95 MGD. The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 232.8 and 41.8 mg/l, respectively. The average total suspended solids (TSS) concentrations were 171.6 mg/l in the influent and 51.6 mg/l in the effluent.

Although the average chlorine residual in the effluent was 4.6 mg/l, effective disinfection of the effluent was not achieved. Median concentrations of 2,701,000 Total Coliform and 350,000 Fecal Coliform bacteria were detected in the final plant effluent. High chlorine demand wastes entering the plant from an industrial source, consumed the chlorine and rendered it ineffective for bacterial disinfection.

The Florida State Performance Criteria require average BOD_5 and TSS removal efficiencies of 90 percent. These criteria were not met for either BOD_5, with an average removal of 79.8 percent, nor for TSS, with an average removal of 70.9 percent. The extreme variation in removal efficiencies for both BOD_5 and TSS would seem to indicate that the principal problem is plant operation.

The following recommendations are made to improve plant operation:

1. That the quality and quantity of industrial wastes flowing into the plant be determined and appropriate steps taken to effectively deal with these wastes, either through pre-treatment or provision of special treatment at the plant.

2. That operation be improved to affect complete disinfection of the effluent.

3. That operation be stabilized to accomplish maximum BOD_5 removal efficiencies.

4. That additional devices be provided, or operation be modified, to affect greater TSS removal efficiencies.

INVENTORY

The three small package plants which make up the total system are similar in that they are activated sludge units with an inner circular compartment which functions as a secondary clarifier. They differ in capacity and operation. Specific details are as follows:

1. The Chicago process plant (capacity of 0.20 MGD). The outer annular compartmented ring consists of a contact stabilization zone (diffused air), chlorine contact chamber, and aerobic digestor.

2. The Walker plant (capacity of 0.250 MGD). The outer ring consists of a contact stabilization zone (diffused air), reaeration zone (diffused air), chlorine contact chamber, and aerobic digestor.

3. The Davco plant (capacity of 0.500 MGD). The outer ring consists of aeration and reaeration zones (diffused air), two-stage aerobic digestor zones, and chlorine contact chamber.

4. Sludge disposal from the plant is accomplished by hauling the liquid sludge to the Dade County Dump.

DISCUSSION OF RESULTS

The average combined flow through the three individual plants was 0.727 MGD during the survey, well below the average design flow of 0.950 MGD. The average BOD_5 of the influent and effluent were 232.8 and 41.8 mg/1, respectively. The average BOD_5 removal efficiency of this plant was 79.8 percent, varying from 71.4 percent to 90.3 percent, indicating erratic plant operation. An average of 253 lbs./day of BOD_5 was discharged to the 138th Street Canal. The average removal efficiencies of COD and TOC were 41.1 percent and 66.3 percent, respectively.

The influent and effluent total suspended solids concentrations averaged 171.6 and 51.6 mg/1, respectively, and the average removal efficiency was 70.9 percent, varying from 62.4 percent to 78.4 percent. This plant discharges 316 lbs./day of TSS. The average volatile suspended solids (VSS) and settleable solids (SS) removal efficiencies were 77.2 percent and 73.6 percent, respectively.

Nutrients discharged by this plant were principally in the form of ammonia nitrogen, 84 lbs./day, and total phosphorus, 80 lbs./day. Twenty-five lbs./day of organic nitrogen was discharged.

The average measured chlorine residual in the effluent of this plant was 4.6 mg/1. However, this is not representative of the normal chlorine residual during the survey, since the operator discovered that the chlorine residual was zero mg/1, immediately prior to arrival of the survey team and took temporary corrective action. Total coliform bacterial population reached over 16,000,000 MPN/100 ml on December 18th and fecal coliform bacteria were 1,700,000 MPN/100 ml on December 16th. Minimum total coliform population reported was 2,400 MPN/100 ml on December 15th.

The daily values for all parameters are presented in the attached Field and Data Summary sheets.

DISCUSSION OF OBSERVATIONS

The principal problem at this plant is the unknown quality and quantity of wastes being processed for the 22 industries located in the Miami Lakes Industrial Park. A listing of these industries is attached.

During the survey period, a problem arose which is apparently symptomatic of the general operational condition of this plant. On December 16, 1970, survey sampling personnel determined that the chlorine residual of the effluent was 0 ppm. The operator assumed that the chlorinator was not working and made an attempt to correct this situation, without success. He then began to allow a light flow of liquid chlorine in the manhole where effluent samples were being taken. After consultation with the utility company representatives the possibility of an industrial "slug", was suggested. Presuming this possibility, a sample of effluent from the Picker's X-Ray Solution Company, one of the industries served by the plant, was collected. The sample was taken to the Pollution Control Consultants, Inc., an independent testing laboratory, for a chlorine demand test. It is understood, unofficially, that the chlorine demand analyses indicated a value of approximately 250 ppm. Further questioning of the operator revealed that this was a recurring problem, and that the standard procedure was to simply attempt to add liquid chlorine to the manhole, a procedure which obviously did little to improve the disinfection efficiency of the plant.

At the time of the survey, operating personnel and management had little or no realization of the unique problems of processing industrial wastes. No effort has been made to assess either the quality or quantity of the wastes generated from each individual industry within the Miami Lakes Industrial Park. Charges for sewage were based upon the volume of water used, without regard for potential strength of wastes.

Since our survey, management has become aware of their problems with this plant and has hired a consulting firm to operate the plant. They have also contracted with a local laboratory to do a complete analysis of the quality and the quantity of wastes from each industry within the Park. It is recommened that a follow-up survey be conducted by local authorities to determine the effectiveness of these revised procedures.

ROBERT L. KING

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Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: December 17, 1970
PLANT NAME: Miami Lakes Utilities
PLANT OWNER: Sengra Development Corporation
ADDRESS: 14045 N.W. 67th Ave., Miami Lakes, Florida 33014
TELEPHONE: 821-1130
COLLECTION SYSTEM – TYPE: Separate.
OWNER: same
ADDRESS:
TELEPHONE:

DESIGN AVERAGE DESIGN FLOW: 0.95 MGD YEAR COMPLETED:
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED 1327 plus 21 industries.

OPERATION ANNUAL COST No data.
PERSONNEL One at time of survey.
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair

OUTFALL TYPE Above water level. SIZE LENGTH
DISCHARGED TO: 138th St. Canal. WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Davco package plant (0.5 MGD), Walker package plant (0.25 MGD), Chicago package plant (0.2 MGD), common chlorinator.

SLUDGE TREATMENT Digesters in each package plant.

DISPOSAL To Dade County dump.

REMARKS

ARED BY: Robert L. King

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

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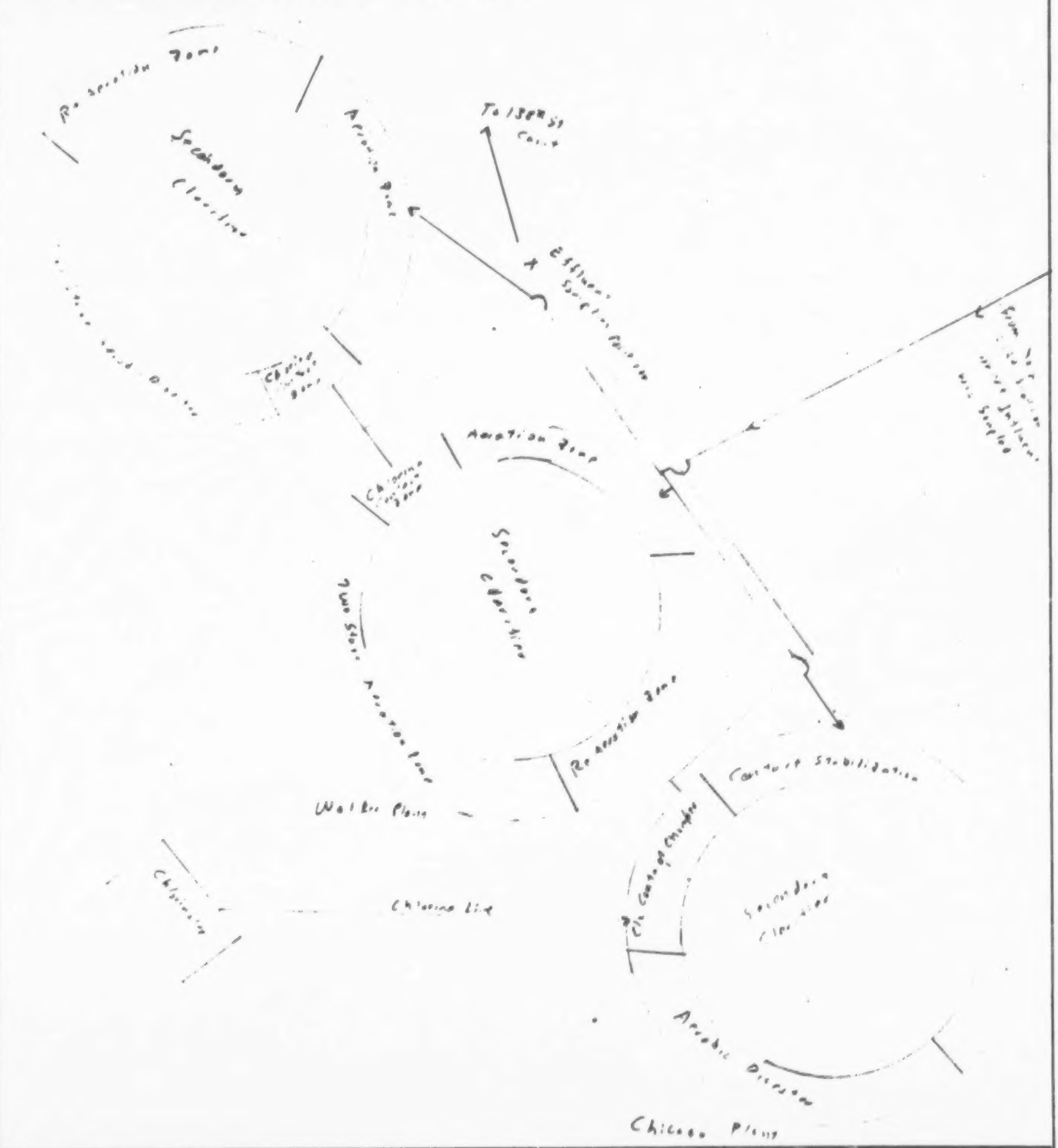
PLANT Miami Lakes Utilities

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Reaeration Zone
Secondary Clarifier
Aeration Zone
To 138th St Canal
Effluent Sampling Station
Aerobic Digester
Chlorine Contact Zone
Chlorine Contact Zone
Aeration Zone
Secondary Clarifier
Two Stage Aeration Zone
Reaeration Zone
Walker Plant
Chlorinator
Chlorine Line
Contact Stabilization
Chlorine Contact Chamber
Secondary Clarifier
Aerobic Digester
Chicago Plant

PREPARED BY:

Sheet 3 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Miami Lakes S.T.P.

DATE - OFF		12/14/70	12/15	12/16/70	12/17	12/18	AVERAGE
FLOW - MGD		0.760	0.733	0.702	0.697	0.741	0.727
5 DAY B O D mg/l	INFLUENT	370	252	161	217	164	232.8
	EFFLUENT	38	46	46	36	43	41.8
	IN - OUT						
	% REMOVAL	[illegible]	[illegible]	71.4	83.4	[illegible]	79.8
	LOAD-lbs/day	241	281	269	209	266	253
C O D mg/l	INFLUENT	711	439	573	731	339	555.6
	EFFLUENT	448	180	607	487	220	[illegible].4
	IN - OUT						
	% REMOVAL	[illegible]	59.0	N/A	33.4	35.1	41.1
	LOAD -lbs/day	2840	1100	3554	2831	1360	2337
T S S mg/l	INFLUENT	204	202		148	168	171.6
	EFFLUENT	74	76		32	42	51.6
	IN - OUT						
	% REMOVAL	63.7	62.4	75.0	78.4	75.0	[illegible]
	LOAD- lbs/day	469	465	199	186	260	316
V S S mg/l	INFLUENT	172	120		[illegible]	136	[illegible]
	EFFLUENT	18	44		[illegible]	32	29
	IN - OUT						
	% REMOVAL	89.5	63.3	73.2	83.3	76.5	77.2
	LOAD –lbs/day	114	269	176	116	198	175
Settlable Solids ml/l	INFLUENT	10	10	5	3	12	8.0
	EFFLUENT	0.0	2	.3	3	.7	1.2
	IN - OUT						
	% REMOVAL	100	80.0	94.0	0	94.2	73.6
T O C mg/l	INFLUENT	125	112.5	95.5	[illegible]	[illegible]	[illegible]
	EFFLUENT	35.5	37.5	165	[illegible]	[illegible]	[illegible]
	IN - OUT						
	% REMOVAL	71.6	66.7	N/A	59.1	67.9	66.3
	LOAD - lbs/day	225	229	966	267	263	390

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released to

From The Desk Of
Michael V. Polito

Sheet 4 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Miami Lakes STP

DATE - OFF		12/14	12/15	12/16/70	12/17	12/18	AVERAGE or MEDIAN*
FLOW - MGD		0.760	0.733	0.702	0.697	0.741	0.727
KTELDAHL NITROGEN as N	CONC.-mg/l	15.1	14.8	16.0	20.7	23.2	18.0
	LOAD-lbs/day	96	90	94	120	143	109
AMMONIA NITROGEN as N	CONC.-mg/l	11.7	11.4	12.0	17.0	17.4	13.9
	LOAD-lbs/day	74	70	70	99	108	84
ORGANIC NITROGEN as N	CONC.-mg/l	3.4	3.4	4.0	3.7	5.8	4.1
	LOAD-lbs/day	22	21	23	22	36	25
NO_2 -NO_3 as N	CONC.-mg/l	2.4	2.3	1.4	0.6	0.6	1.7
	LOAD-lbs/day	15	20	8	3	4	10
TOTAL PHOSPHORUS AS P	CONC.-mg/l	12.3	13.7	12.8	13.4	13.6	13.2
	LOAD-lbs/day	78	84	75	78	84	80
CHLORIDE	CONC.-mg/l	66	70	74	78	86	74.8
TOTAL COLIFORM	CONC.-MPN/100ml	3,300	2,400	5,400,000	~~>16,000,000~~	>16,000,000	2,701,650
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	1,700,000	~~700,000~~	700,000	350,009

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet 5 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Miami Lakes S.T.P.

DATE ON		13 Dec 70	14 Dec 70	15 Dec 70	16 Dec	17 Dec	AVERAGE
TIME ON		1019	1400	1334	1336	1418	
DATE OFF		14 Dec 70	15 Dec 70	16 Dec 70	17 Dec	18 Dec	
TIME OFF		1400	1334	1336	1418	1036	
FLOW	START X 00	48224550	48233323	48240530	48247550	48254727	
	END	48233323	48240530	48247550	48254727	48260996	
	TOTAL	8773	7207	7020	7177	6269	
	24 hr. Flow Rate	760,100	732,900	702,000	697,360	741,163	726,205
INF.	TEMP. ON	26.5 °C	26.1 °C	26.3 °C	26.0 °C	25.5	26.1
	PH - ON	9.8	9.3	7.7	7.3	7.5	8.3
EFFLUENT	TEMP - ON	26.3 °C	26.1 °C	26.4 °C	26.5	25.5	26.2
	PH - ON	9.8	9.8	6.7	7.5	6.7	8.1
	Cl. Residual	3.0	2.0	0/White	10	8	4.6
	CHLORINE-ON	-	446 #	401.0 #	346.5	562 62	439
	CHLORINE-OFF	446 #	401 #	346.5 #	260 #	504 #	392
	ON-OFF-lbs	-	45 #	55 #	86.5 #	58	61

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
13 Dec 70	Suds	OK	—	—
14 Dec 70	Suds	OK	—	CAE
15 Dec 70	Suds	O.K.	—	CAE
16 Dec 70	Suds	O.K.	—	CAE
17 Dec 70	Suds	1245 - Started dribbling Cl^- into manhole where sampler located.	—	
18 Dec	Suds in eff	* OK	—	

INDUSTRIES LOCATED IN MIAMI LAKES INDUSTRIAL PARK

All Tech Industries

The AFA Corporation

Continental Trading Corporation

Copystatics - Rollo Asmussen

Copystatics

Dunlop

Electronic Products

Gac Properties, Inc. - A. L. Materson, Ken Slatkoff, Anthony Perrici

Gac Properties, Inc. - Harold E. Smith, Production Mgr.

General Wig

York Litho

Miami Handprint

Minnesota 3M Export, Inc.

Picker Corporation

Plumbers Joint Apprentice & Educational Committee

Radiation

R B & W Industrial Plastics

Security Plastics

Suave Shoe

Tiffany

Western Microwave

Wilson Sporting Goods

INDUSTRIES LOCATED IN MIAMI LAKES INDUSTRIAL PARK

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Western Microwave

Wilson Sporting Goods

LOWER FLORIDA ESTUARY STUDY
Inspection Report on
Myrtle Grove Wastewater Treatment Plant
North Miami Beach Utilities
NW 179 St. and NW 31 Avenue
Miami, Florida

INTRODUCTION

The Myrtle Grove plant was surveyed during the period January 17-22, 1971. All units were operating satisfactorily during the survey.

Personnel involved in the survey were:

Robert Harp, Sanitary Engineer, EPA, DFI-DC
Larry Walz, Field Technician, EPA, DFI-DC
Terry Davis, Field Technician, Florida Department of Air
  and Water Pollution Control
Joe Hopson, Field Inspector, Dade County Pollution Control

The principal contact at the plant was Mr. N. E. Ivey, Superintendent.

Five twenty-four hour composite samples were collected on the influent at the bar screen and the effluent as it leaves the final clarifier.

INVENTORY

Treatment is provided by the activated sludge process. Construction of the existing plant started prior to 1956 and was completed in 1961. The following processes are used:

Grit Chambers;

Bar Screens;

4 Primary Sedimentation Tanks - (63' x 14' x 10.5' average depth);

4 Aeration Basins (28' x 84' x 16.5' average depth) with mechanical aeration;

4 Secondary Clarifiers (16' x 75' x 9' average depth);

4 Anaerobic Digesters - 1-28' diameter, 3-36' diameter. Chlorine contact chamber

Final sludge disposal - trucked to approved disposal site.

Total plant design capacity is 4 MGD.

OBSERVATIONS AND DISCUSSION

Plant Operation

During the survey, the incoming sewage to the plant often had a septic odor. Moreover, on separate occasions, the influent had noticeable color - green, red, blue, and black. This latter was attributed to industrial waste waters. Mr. Ivey estimated that about 25 percent of the plant flow is from two industrial parks (Sunshine State and Miami). He reported that the treatment processes have been upset by industrial waste "slugs" from the milk and plating processes, subsequently upsetting plant operations and causing odor problems. The foam build-up on the aeration basins was observed several times at depths of 2-3 feet. Spray devices are employed to control this foam build-up with some success.

A private laboratory has conducted an industrial waste survey of those industries discharging to the Myrtle Grove Plant. Mr. Ivey could provide no information on the findings of the aforementioned report. A copy of this report has been requested by the FWQA. The following is a list of those industries known to discharge to the Myrtle Grove plant:

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Name	Products or Processes
Miller Industries, Inc.	Aluminum sliding doors, grills and tub enclosures.
Anodyne	Lithograph and silk screens.
Arrow Beef Corporation	Cutting or deboning of beef carcasses.
Aluminaire, Inc.	Aluminum grills.
Velda Farm Division of the Southland Corporation	Milk and ice cream.
Perkins Marine Lamp and Hardward Corporation	Marine hardware.
Sealtest Foods Southern Division, Kraft Company	Dairy products.
Atlas Metal Industries, Inc.	Food processing and computer equipment.

Present plans call for abandoning the Myrtle Grove plant by July 1971 and diverting present flow to the North Miami Beach ocean outfall. These wastes would then receive only "preliminary" treatment which consists of passing the wastes through a sedimentation basin to remove the floatable materials, i.e., scum and grease. The settled solids are pumped back into the outfall line. Eliminating the Myrtle Grove treatment plant would increase the present BOD and SS loads to the ocean through the North Miami Beach outfall by approximately 3400 and 5400 lbs./day, respectively. This plan is not consistent with the Conferees' recommendations that all wastewater going to the ocean receive 90 percent treatment by January 1, 1974.

Mr. Ivey related that Sealtest, Velda Farms, Anodyne, and Perkins contributed the major portion of the industrial wastewater.

No information was available on operation and maintenance costs. Mr. Ivey suggested that Mr. John A. Marchose, Director, City of North Miami Beach Public Utilities Sewer Department be contacted for this information.

The control tests performed at the plant are:

Dissolved Oxygen - secondary clarifier and aeration basins;

Settleable Solids - influent and effluent;

30-minute settleability;

Suspended solids aeration basin (centrifuge);

Chlorine Residual.

A private laboratory collects 8-hour composite samples (0700-1500) twice monthly on the influent and effluent. Tests performed are:

BOD;

Total Solids;

Fixed Solids;

Suspended Solids;

Fixed Suspended Solids;

pH;

Grease;

Chlorine Residual;

Aerater Dissolved Oxygen;

Digester - Alkalinity as $CaCO_3$,
Volatile Acids,
pH.

A review of several months' laboratory analyses from the private laboratory indicated the Myrtle Grove plant was providing above 90 percent removals of BOD and suspended solids.

RESULTS OF SURVEY

During the first day of the survey, no influent sample was collected; thus, the average flow and removal efficiencies are calculated for the remaining four days.

The average flow for the four-day survey period was 1.645 MGD. The chlorine residual in the plant effluent measured 1.5 mg/l or above during the survey.

The data were evaluated to determine compliance with the recommendations of the Conferees to the Dade County Enforcement Conference held October 22, 1970. These recommendations require compliance with the State of Florida regulations, i.e., 90 percent removal of the organic material in domestic and industrial waste waters.

A review of the laboratory data show that the average BOD and TSS removals were approximately 92 and 94 percent respectively during the survey. Daily removal efficiencies for these two parameters were consistently above 90 percent. The total organic carbon removal for the survey period averaged about 78 percent (attachment No. 2).

CONCLUSIONS AND RECOMMENDATIONS

During the survey, the Myrtle Grove sewage treatment plant was providing adequate treatment on the basis of BOD and suspended solids removals. Approximately 25 percent of the flow is due to industrial waste water discharges which have on occasion disrupted plant operations and caused odor problems. The quality of the industrial discharges is not known. A private firm recently conducted a survey of these industries to determine the quality and quantity of wastes discharged to the plant. The results of that survey were unavailable.

This plant is scheduled to be abandoned by July 1971. This is inconsistent with the Conferees' recommendations that all discharges to the ocean receive 90 percent treatment. Therefore, we recommend that the Myrtle Grove plant be kept in service until the 90 percent treatment is provided to the wastes discharged through the North Miami Beach outfall.

Prepared By:

Robert D. Harp
Laurence R. Walz

ATTACHMENT NO. 1

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Sheet 1 of 1

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF SURVEY January 17-22, 1971
PLANT NAME Myrtle Grove
PLANT OWNER City of North Miami Beach Public Utilities Sewer Department
ADDRESS NW 179 Street and NW 31st Avenue
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER North Miami Beach Public Utilities Sewer Department
ADDRESS: NW 179 Street and NW 31st Avenue
TELEPHONE

AVERAGE DESIGN FLOW: 4.00 MGD YEAR COMPLETED: 1961 - Present System
DURATION days FREQUENCY Yrs
CONSTRUCTION COST Unknown
POPULATION SERVED Estimate at 21,000, Significant Industrial Discharges

OPERATION ANNUAL COST Unknown
PERSONNEL Supervisor - 4 assistants
LEVEL OF CERTIFICATION Supervisor only (Class B license)
CONDITION OF EQUIPMENT Satisfactory
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Coral City Canal B
Trib. to Snake Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Grit chambers, bar screens, 4 primary clarifiers, 4 aeration tanks (3 mechanical aeraters each basin), 4 secondary clarifiers, chlorine contact chamber (30 minutes @average flow).

SLUDGE TREATMENT Anaerobic digesters - 4

DISPOSAL Final disposal by trucking to approved county dumping site.

REMARKS Plant receives industrial wastes from two industrial parks (Sunshine State and Miami). Industrial waste waters from milk processing, plating, and dye processes have "slugged" plant in past. During survey, plant influent was noted to be green, black, red, and blue on separate occasions.

Reproduced from best available copy.

PREPARED BY: Bob Harp

Sheet ___ of _____

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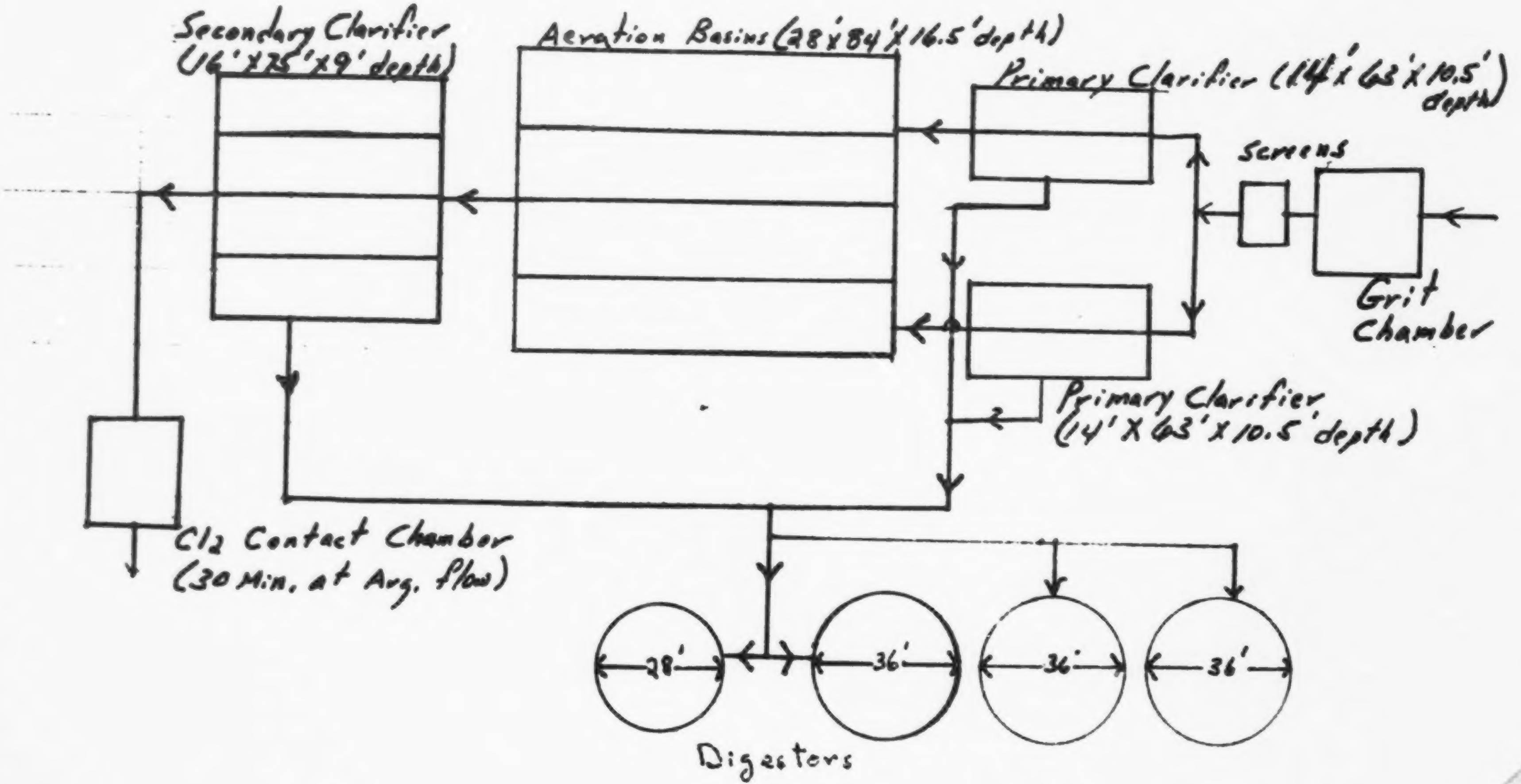
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Myrtle Grove

DATE ON		17 Jan, 71	18 Jan, 71	19 Jan, 71	20 Jan, 71	21 Jan 71	AVERAGE
TIME ON		0830	0905	0905	0911	0911	
DATE OFF		18 Jan, 71	19 Jan, 71	20 Jan, 71	21 Jan, 71	22 Jan, 71	
TIME OFF		0905	0905	0911	0911	0911	
FLOW	START	79836	81168	82976	84664	86,343	
	END	81168	82976	84664	86343	88102	
	TOTAL X 1000	1332	1808	1688	1679	1759	
	24 hr. Flow Rate	1,299,512	1,808,000	1681,000	1,679000	1,759,000	1,645,302
INF.	TEMP. ON	25.4	25.2	24	23.4	24.6	24.5
	PH - ON	7.6	7.0	6.9	6.9	6.7	7.0
EFFLUENT	TEMP - ON	22.8	23.8	21.4	22.4	23.8	22.8
	PH - ON	6.8	6.7	6.4	6.4	6.7	6.6
	Cl. Residual	1.5	1.5	1.5	1.5	>5.0	>2.2
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
18 Jan 71	Normal	Slight flock coming out of sec. clarifier	Inf - 20 sample clock stopped (over)	
19 Jan 71	#6 - blue #18 - red #15 - black Detergent foam in cl. chamber	Normal	Inf - #16 black	
20 Jan 71	Detergent foam in Cl. chamber	Normal	over	
21 Jan 71	Same as above	Normal	over	
22 Jan 71	Same as above	Normal	over	

FIGURE 1: MYRTLE GROVE WASTEWATER TREATMENT PLANT


Secondary Clarifier (16'X75'X9' depth)
Aeration Basins (28'X84'X16.5' depth)
Primary Clarifier (14'X63'X10.5' depth)
Screens
Grit Chamber
Primary Clarifier (14'X63'X10.5' depth)
2
Cl2 Contact Chamber (30 Min. at Avg. flow)
28'
36'
36'
36'
Digestors

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

Sheet ___ of _____

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PLANT Myrtle Grove

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE
FLOW - MGD							
5 DAY B O D mg/l	INFLUENT	N/S	283	252	200	263	250
	EFFLUENT	25	20	22	18	21	21
	IN - OUT						
	% REMOVAL	N/A	92.9	91.3	91.0	92.0	91.8
	LOAD-lbs/day						
C O D mg/l	INFLUENT	N/S	936	466	392	352	537
	EFFLUENT	102	49	105	84	76	83
	IN - OUT						
	% REMOVAL	N/A	94.7	77.5	78.6	78.4	82.3
	LOAD -lbs/day						
T S S mg/l	INFLUENT	N/S	432	428	280	436	394
	EFFLUENT	27	11	33	23	28	24
	IN - OUT						
	% REMOVAL	N/A	97.5	92.3	91.8	93.6	93.8
	LOAD- lbs/day						
V S S mg/l	INFLUENT	N/S	424	256	232	424	334
	EFFLUENT	25	8	27	17	26	21
	IN - OUT						
	% REMOVAL	N/A	98.1	89.5	92.7	93.9	93.6
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	N/S	10	7	7	10	8.5
	EFFLUENT	0.0 -	0.1	0.1	0.1	Inf.Sm	.1
	IN - OUT						
	% REMOVAL	100	99	98.6	98.6	N/A	99.1
T O C mg/l	INFLUENT		175	140	140	140	149
	EFFLUENT		29	41	43	28	33
	IN - OUT						
	% REMOVAL	N/A	83.4	70.7	69.3	80.0	77.9
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

**From The Desk Of
Michael V. Polito**

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

Sheet____ of______

PLANT Myrtle Grove

284<

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	[illegible]	27.8	24.5	23.9	26.5	25.6
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	[illegible]	22.0	21.5	21.5	24.5	[illegible]
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	[illegible]	[illegible]	3.0	2.4	2.0	2.3
	LOAD-lbs/day						
NO_2 - NO_3 as N	CONC.-mg/l	[illegible]	0.02	0.01	0.01	0.01	0.01
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	[illegible]	12.5	10.5	9.1	10.3	[illegible]
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	[illegible]	57	67	67	[illegible]	64.4
TOTAL COLIFORM	CONC.-MPN/100ml			<1-	<1-	<1-	<1-
Fecal COLIFORM	CONC.-MPN/100ml	<1-	<	<1-	<1-	<1-	<1-

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Myrtle Grove

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE
FLOW - MGD							[illegible]
5 DAY BOD mg/l	INFLUENT	N/S	253	252	200	263	250
	EFFLUENT	25	20	22	18	21	21
	IN - OUT						
	% REMOVAL	N/A	92.9	91.3	91.0	920	91.8
	LOAD-lbs/day						
COD mg/l	INFLUENT	N/S	936	466	392	352	537
	EFFLUENT	102	49	105	84	76	83
	IN - OUT						
	% REMOVAL	N/A	94.7	77.5	78.6	78.4	82.3
	LOAD -lbs/day						1141
TSS mg/l	INFLUENT	N/S	432	428	280	436	394
	EFFLUENT	27	11	33	23	28	24
	IN - OUT						
	% REMOVAL	N/A	97.5	92.3	91.8	93.6	93.8
	LOAD- lbs/day						[illegible]
VSS mg/l	INFLUENT	N/S	424	256	232	424	334
	EFFLUENT	25	8	27	17	26	21
	IN - OUT						
	% REMOVAL	N/A	98.1	89.5	92.7	93.9	93.6
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	N/S	10	7	7	10	8.5
	EFFLUENT	0.0-	0.1	0.1	0.1	InfSam	.1
	IN - OUT						
	% REMOVAL	100	99	98.6	98.6	N/A	99.1
TOC mg/l	INFLUENT		175	110	140	140	149
	EFFLUENT		29	41	43	28	33
	IN - OUT						
	% REMOVAL	N/A	83.4	70.7	69.3	80.0	77.9
	AD - lbs/day						[illegible]

INFLUE POPULATION EQUIVALENT = ________

EFFLUEN POPULATION EQUIVALENT = ________

LOAD = MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From Th esk Of
Michae Po

Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Myrtle Grove

DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	25.1	27.8	24.5	23.9	26.5	25.6
	LOAD-lbs/day						[illegible]
AMMONIA NITROGEN as N	CONC.-mg/l	21.8	27.0	21.5	21.5	24.5	23.3
	LOAD-lbs/day						[illegible]
ORGANIC NITROGEN as N	CONC.-mg/l	3.3	0.8	3.0	2.4	2.0	2.3
	LOAD-lbs/day						~~31.6~~
NO_2 -NO_3 as N	CONC.-mg/l	0.02	0.02	0.01	0.01	0.01	0.01
	LOAD-lbs/day						~~.1~~
TOTAL PHOSPHORUS AS P	CONC.-mg/l	11.0	12.5	10.5	9.1	10.8	10.8
	LOAD-lbs/day						~~147~~
CHLORIDE	CONC.-mg/l	52	57	67	67	104	69.4
							~~954~~
TOTAL COLIFORM	CONC.-MPN/100ml	220	78	<18	<18	<18	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from Opa Locka Airport Waste Water Treatment Plant
Dade County Port Authority
Opa Locka, Dade County, Florida
March 19, 1971

INTRODUCTION

The Opa Locka Waste Water Treatment Plant was surveyed during the period February 1 - 3, 1971. The plant is a trickling filter system. Serco automatic samplers were utilized to collect two 24-hour composites of influent and effluent before chlorination. Messrs. Lawrence Walz, Terry Davis and Joe Hopson were the sample collectors. Primary contact was Mr. Philip Tracy, Chief Operator, Dade County Port Authority, Opa Locka Airport.

SUMMARY AND CONCLUSIONS

The average flow during the study period was 0.18 MGD which is 12% of the design flow. The average effluent five-day biochemical oxygen demand (BOD) and total suspended solids loads discharged were 52.4 and 25.6 lbs. per day respectively.

There was no chlorine residual in the effluent and bacterial concentrations were extremely high.

This plant did not provide 90% removal for BOD or total suspended solids. The average removal efficiencies were 82% for BOD and 87% for total suspended solids.

The average removal efficiencies and loads were calculated from the daily values.

INVENTORY

The plant is designed for a total flow of 1.5 MGD, but presently has an average actual flow of approximately 0.18 MGD.

Major components are as follows:

1. Bar rack.
2. Two-cell primary clarifier.
3. Trickling filter.
4. Two-cell secondary clarifier.
5. Chlorine contact chamber.

RESULTS

This plant is drastically underloaded. It was designed for 1.5 MGD and it received 0.18 MGD during the study period. The average influent and effluent BOD concentrations were 187 and 34 mg/l (52.4 lbs. per day) respectively. The average concentrations of total suspended solids were: influent, 129 mg/l; and effluent, 16 mg/l (25.6 lbs. per day). The plant provided 82% removal for BOD and 87% removal for total suspended solids.

Most of the nutrients discharged were in the inorganic form. The average nitrite-nitrate nitrogen and total phosphorus concentrations discharged were 25 mg/l (38.4 lbs. per day) and 9.2 mg/l (14.2 lbs. per day) respectively.

The daily data are presented in the attached Field and Data Summary Sheets.

DISCUSSION

The primary problem with this plant is extremely low flow. A flow of 12% of design flow causes excess detention time, and subsequent septic conditions in the primary clarifier. Other problems are as follows:

1. The irregular flow pattern, caused by faulty lift station operation. The operator informed us that control valves in the lift stations did not function properly causing influent of the plant to be highly irregular.

2. Strong odor, apparently caused by inflow from the Florida Memorial College area. The lift station at the college does not operate at a sufficient rate to preclude aging of the sewage.

3. The biota in the trickling filter appeared unhealthy. Mr. Tracy had conferred with the Dade County Pollution Control Board, requesting permission to by-pass and clean the filter. This permission was denied.

4. During the two-day survey, there was no chlorine residual in the effluent. When questioned, the operator was unaware that this problem existed and stated that he would investigate this matter.

It is our understanding that this plant is to be closed, and the effluent is to be diverted to the North Miami outfall. Due to the relatively low flow and the many problems in operation of the plant, this plan is sound.

LAWRENCE W. OLINGER

ROBERT L. KING

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Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: February 3, 1971
PLANT NAME: Opa Locka Airport
PLANT OWNER: Dade County Port Authority
ADDRESS: Opa Locka, Florida 33054
TELEPHONE:
COLLECTION SYSTEM – TYPE: separate
OWNER: same as above
ADDRESS:
TELEPHONE:

PLANT AVERAGE DESIGN FLOW: 1.5 MGD YEAR COMPLETED: No data.
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED Florida Memorial College - 5,000, Opa Locka Airport - 7,000, plus Coast Guard installation and Girrard Packing Company.

OPERATION ANNUAL COST
PERSONNEL - Chief Operator plus one assistant. and two maintenance repairmen.
LEVEL OF CERTIFICATION Chief Operator has C.
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Biscayne Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Two-cell primary clarifier, trickling filter, secondary clarifier, chlorine contact chamber.

SLUDGE TREATMENT Anaerobic digester

DISPOSAL Two sludge drying beds.

REMARKS

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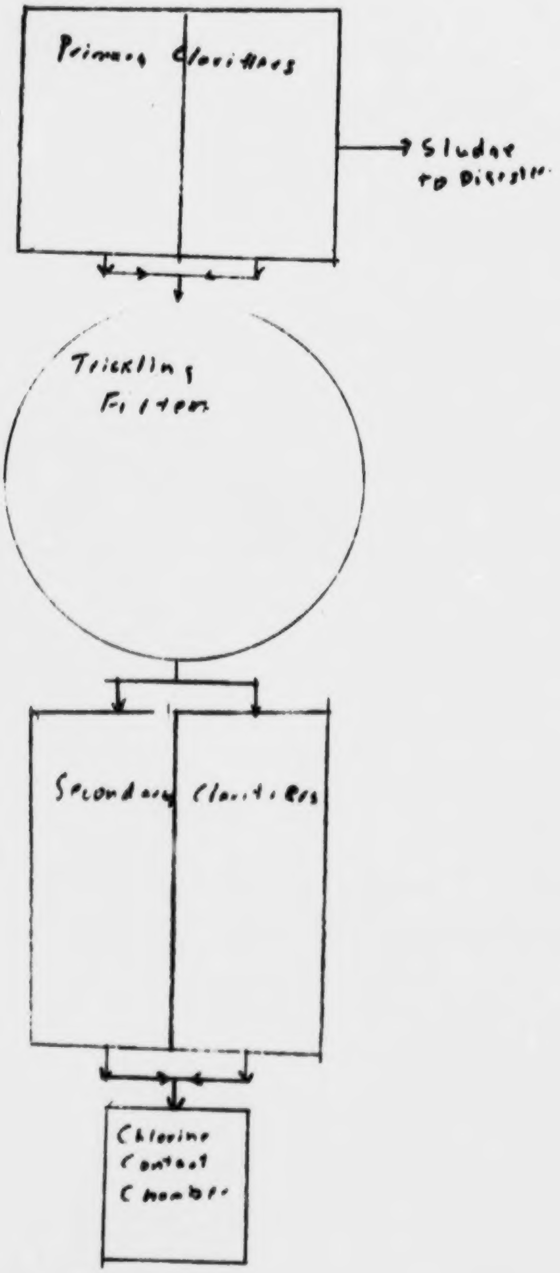
Opa Locka Airport Wastewater Treatment Plant


Primary Clarifiers
Sludge to Digester
Trickling Filter
Secondary Clarifiers
Chlorine Contact Chamber

Sheet ___ of ______

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT OPA LOCKA

DATE - OFF		2/1/71	2/2/71				AVERAGE
FLOW - MGD		.18	.19				0.185
5 DAY BOD mg/l	INFLUENT	184	190				187
	EFFLUENT	35	33				34
	IN - OUT						
	% REMOVAL	81	83				82
	LOAD-lbs/day	52.5	52.3				52.4
COD mg/l	INFLUENT	1185	758				972
	EFFLUENT	64	85				74
	IN - OUT						
	% REMOVAL	95	89				92
	LOAD -lbs/day	96.1	134.7				115.4
TSS mg/l	INFLUENT	110	148				129
	EFFLUENT	14	19				16
	IN - OUT						
	% REMOVAL	87	87				87
	LOAD- lbs/day	21.0	30.1				25.6
VSS mg/l	INFLUENT	82	116				99
	EFFLUENT	11	12				12
	IN - OUT						
	% REMOVAL	87	90				88
	LOAD --lbs/day	16.5	19.0				17.8
Settlable Solids ml/l	INFLUENT	4	4				4
	EFFLUENT	0.1	0.5				.3
	IN - OUT						
	% REMOVAL	98	88				93
TOC mg/l	INFLUENT	70	75				72
	EFFLUENT	19	20				20
	IN - OUT						
	% REMOVAL	73	73				73
	LOAD - lbs/day	28.5	31.7				30.1

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released MP

From The Desk Of
Michael V. Polito

Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

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PLANT OPA LOCKA.

DATE - OFF		2/1	2/2				AVERAGE or MEDIAN*
FLOW - MGD		.18	.19				.185
KTELDAHL NITROGEN as N	CONC.-mg/l	4.1	5.5				4.8
	LOAD-lbs/day	6.2	8.7				7.4
AMMONIA NITROGEN as N	CONC.-mg/l	0.22	3.53				1.88
	LOAD-lbs/day	.33	5.6				3.0
ORGANIC NITROGEN as N	CONC.-mg/l	3.9	2.0				3.0
	LOAD-lbs/day	5.9	3.2				4.6
NO_2 -NO_3 as N	CONC.-mg/l	27.0	23.00				25.0
	LOAD-lbs/day	40.5	36.4				38.4
TOTAL PHOSPHORUS AS P	CONC.-mg/l	9.1	9.2				9.2
	LOAD-lbs/day	13.7	14.6				14.2
CHLORIDE	CONC.-mg/l	200	185				192
TOTAL COLIFORM	CONC - MPN/100ml	330,000	950,000				640,000
Fecal COLIFORM	CONC . MPN/100ml	70,000	240,000				155,000

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Paul
Miller

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

Sheet ___ of _____

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PLANT Opa Locka Airport

							AVERAGE
DATE ON		2/1/71	2/2/71				
TIME ON		0840	0815				☒
DATE OFF		2/2/71	2/3/71 15F				☒
TIME OFF		0815	~~[illegible]~~ 0800				☒
FLOW	START X100	204237	206016				☒
	END	206016	207992				☒
	TOTAL	177900	197600				☒
	24 hr. Flow Rate	~~[illegible]~~	189575				185309
INF.	TEMP. ON 2/1/71	~~[illegible]~~ 23.4	2/2/71 22				
	PH - ON	~~23.~~ 6.6	6.7				
EFFLUENT	TEMP - ON	20.3	21.4				
	PH - ON	6.2	6.6				
	Cl. Residual	0	0				
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
2/2/71	Normal except influent "stinks"	Normal	OK	
2/3/71	due to staying so long in the lines	Normal	[illegible] no Sample	R Y K.

LOWER FLORIDA ESTUARY STUDY
Inspection Report On
Palm Springs North Sub-Division Wastewater Treatment Plant
7900 NW 178th Street
Miami, Florida
March 3, 1971

INTRODUCTION

The Palm Springs North Sub-Division wastewater plant was surveyed during the period January 17-22, 1971. Secondary treatment is accomplished by an activated sludge system followed by additional treatment in a Jet-Flo (brand name) system. The effluent is chlorinated prior to discharge to the 77th Avenue Canal.

SERCO samplers were set at the headworks (Figure 1) and the effluent end (after chlorination). A seed sample was collected daily to be used in performing the effluent BOD analyses. A grab sample of the effluent was collected daily for bacteriological analysis. The chlorine residual of the effluent was also determined at that time.

Personnel involved in the survey were:

Robert Harp, Sanitary Engineer, EPA, DFI-DC
Larry Walz, Field Technician, EPA, DFI-DC
Terry Davis, Field Technician, Florida Department of Water and Air Pollution Control
Joe Hopson, Field Inspector, Dade County Pollution Control

Principal contacts at the plant were:

Bill Case, Chief Operator
Fred Marshall, Operator

Additional information on the treatment processes is contained in Attachment No. 1 and Figure No. 1.

INVENTORY

The original plant, consisting of grit chamber, bar screen, primary sedimentation, aeration basin, final sedimentation basin, chlorine contact chamber, digester, and sludge drying beds was constructed in 1961. The capacities of the aeration basin, final sedimentation basin and chlorine contact chamber were doubled and the Jet-Flo system was installed during 1970. The secondary clarifier has a surface loading rate of 720 gallons/ft^2/day at design flow. At peak flows (900,000 gpd) the loading rate is about 860 gallons/ft^2/day. Mr. Case stated the secondary clarifiers are too small. At the time of this survey, some solids were observed passing the weir of the secondary clarifiers. The final effluent after passing through the filter system of the Jet-Flo process was visibly free of solids.

The plant design factors were 0.17 lbs. BOD and 80 gallons flow per capita per day. On this basis, the plant has the capacity for approximately 9,500 population equivalent or 1600 lbs./BOD per day.

The primary sludge and waste activated sludge are discharged to an open-top, unheated, anaerobic digester. The digester contents were covered with a thick layer of scum. All gases are released through the open top. Sludge is withdrawn for disposal on drying beds. Mr. Case indicated the digester provides about 40 days retention. No strong odors were detected from the digestion process during the survey.

DISCUSSION

Plant Operation

Two operators and one maintenance man are employed at this plant. The Chief Operator has a Class A license, the other operator is studying for classification as a "C" operator. The plant is well maintained. Mr. Case and his staff were very cooperative in the conduct of the survey. The following control tests are performed by plant personnel:

1. Thirty-minute settling test on the aeration tank effluent.
2. DO tests on the aeration tank effluent and plant effluent.
3. Settleable solids on influent and effluent.
4. Suspended solids on influent and effluent.
5. BOD (once per week) on influent and effluent.
6. Chlorine residual.

In addition, a private laboratory collects composite samples monthly of the influent and effluent for BOD, suspended solids, and settleable solids determination.

Mr. Case stated that about 40 lbs. per day of chlorine are used. The chlorine is fed at a constant rate. They attempt to maintain at least 2 mg/l chlorine residual in the effluent at all times (see laboratory results). Dade County pollution control authorities require 0.5 mg/l residual after 30 minutes contact.

Results of Survey Sampling

During the survey the average daily flow was 0.447 MGD, the average influent BOD was 265 mg/l (990 lbs./day) and the effluent BOD averaged 18 mg/l (67 lbs./day) indicating an average BOD reduction of about 93 percent.

The suspended solids reduction was consistently above 98 percent. The aforementioned removal efficiencies are above the recommendations of the Conferees to the Dade County Enforcement Conference held October 22, 1970. These recommendations require compliance with the State of Florida regulations, i.e., 90 percent removal of the organic material in domestic and industrial wastewaters. Although no regulations have been established for total organic carbon (TOC) removal, it is noteworthy that this plant was removing almost 90 percent of the TOC during the survey period.

The results of the laboratory and the field measurements are contained in Attachment No. 2.

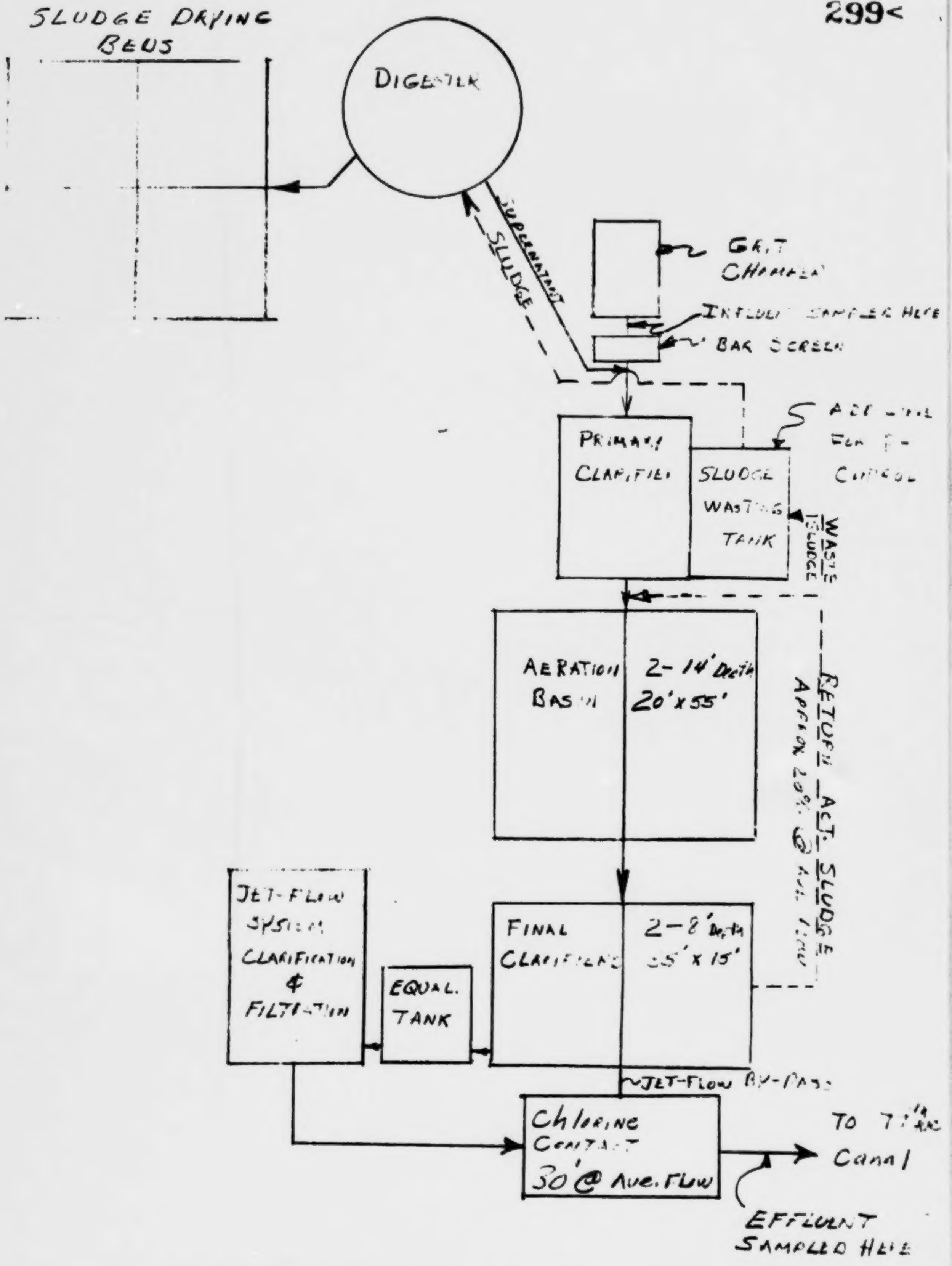
CONCLUSIONS

The Palm Springs North Sub-Division wastewater treatment facility was providing adequate treatment with BOD and suspended solids removals in excess of 90 percent. This is consistent with the recommendations of the Conferees to the Dade County Enforcement Conference.

Prepared By:

Robert D. Harp
Laurence R. Walz

FIGURE 1 PALM SPRINGS NORTH SUB-DIVISON


SLUDGE DRYING BEDS
DIGESTER
SUPERNATANT
SLUDGE
GRIT CHAMBER
INFLUENT SAMPLED HERE
BAR SCREEN
ADD LIME FOR pH CONTROL
PRIMARY CLARIFIER
SLUDGE WASTING TANK
WASTE SLUDGE
AERATION BASIN
2- 14' Depth 20'x55'
RETURN ACT. SLUDGE
Approx 20% @ Ave. Flow
JET-FLOW SYSTEM CLARIFICATION & FILTRATION
EQUAL. TANK
FINAL CLARIFIERS
2-8' Depth 35' x 15'
JET-FLOW BY-PASS
Chlorine Contact
30' @ Ave. FLOW
TO 7th Ave Canal
EFFLUENT SAMPLED HERE

Palm Springs No. Sub.
7400 NW 178 ST.
CASE - Supt - A
Design Cap. - 0.4 MGD
Conv. Activated Sludge

	Raw	Final
5 Day BOD	251	92%
Total Solids	650	442

ATTACHMENT No. 1

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Sheet 1 of 1

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 17-23, 1971

PLANT NAME: Palm Springs North Sub-Division

PLANT OWNER: Same

ADDRESS: 7900 NW 178th Street, Miami, Florida

TELEPHONE:

COLLECTION SYSTEM – TYPE: Sanitary and separate

OWNER: Same as plant

ADDRESS: Same as plant

TELEPHONE:

DATA AVERAGE DESIGN FLOW: 0.750 MGD YEAR COMPLETED: 1970*

STREAM FLOW cfs | DURATION days FREQUENCY Yrs

CONSTRUCTION COST - Unknown

POPULATION SERVED Presently 1646 water meters (1623 Residences, 23 small businesses), est. population 6000.

OPERATION ANNUAL COST Chief Operator could not supply this information.

PERSONNEL 2 operators, 1 maintenance man

LEVEL OF CERTIFICATION Chief Operator Class A License, Other operator working for Class C License.

CONDITION OF EQUIPMENT Good

OUTFALL TYPE SIZE LENGTH Est. 0.3 mile

DISCHARGED TO: 77th Ave. Canal WATER COURSE MILEAGE: **

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL) Lift Station, bar screen, primary sedimentation, (1 tank); 2 aeration tanks - designed for 0.375 MGD; 2 secondary sedimentation tanks; equalizing tank for Jet-Flo system; Jet-Flow system, chlorine contact chamber.

SLUDGE TREATMENT Anaerobic digester (open top, unheated) - 1 tank only. Lime added in sludge wasting tank for digesters, pH control. Supernatant to primary sed. tank.

DISPOSAL Sludge to concrete lined (gravel bottom) underdrained with tile, any drainage to lift station.

REMARKS This plant receives no industrial wastes. Jet-Flo system recently added to enhance secondary treatment quality. Control tests include setteable solids (I&E), 30-min. settling test (aeration tanks) DO aeration tank and effluent, suspended solids and BOD (I&E), pH (digester).

*Original plant built 1961 - 0.375 MGD. Capacity doubled in 1970.

**Point of discharge - Approximately 150 feet from the corner of 178st and NW 77 Court

PREPARED BY: Robert Harp and Larry Walz

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Sheet 1 of 2

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Palm Springs North

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DATE ON		17 Jan. 71	18 Jan. 71	19 Jan. 71	20 Jan. 71	21 Jan. 71	AVERAGE
TIME ON		1015	1115	1115	1121	1145	
DATE OFF		1/18/71	19 Jan. 71	20 Jan. 71	21 Jan. 71	22 Jan. 71	
TIME OFF		1115	1115	1121	1143	1045	
FLOW	START	216087	221833	225652	229663	233558	
	END	221833	225652	229663	233558	238550	
	TOTAL x 1000	5746	3819	4011	3895	4992	
	24 hr. Flow Rate	551,616	381,900	399,436	383,114	520,904	447,394
INF.	TEMP. ON	24.5	25.4	24.4	24.5	23.8	24.5
	PH - ON	7.6	7.2	7.2	6.7	7.5	7.2
EFFLUENT	TEMP - ON	24.5	23.2	21.4	22.5	23	22.9
	PH - ON	6.8	6.8	6.5	7.0	6.5	6.7
	Cl. Residual	> 2.5	> 2.5	1.5	1.0	1.5	> 1.8
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
18 Jan. 71	Normal	Normal	O.K.	
19 Jan. 71	Normal	Normal	O.K.	
20 Jan. 71	Normal	Normal	Inf - #3 - 60 ml 5 - 120 ml 24 - 70 ml	
21 Jan. 71	Normal	Normal	Inf - #1 - 30 ml	
22 Jan	Normal	Normal	Inf - #3, 10 18 blank	

Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT - EFFLUENT - DATA SUMMARY
PLANT Palm Springs – N. Subdivision

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DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE
FLOW - MGD							
5 DAY B O D mg/l	INFLUENT	232	222	230	265	375	265
	EFFLUENT	21	20	16	18	15	18
	IN - OUT						
	% REMOVAL	90.9	90.9	93.0	93.2	96.0	92.8
	LOAD-lbs/day						
C O D mg/l	INFLUENT	745	897	931	1434	444	890
	EFFLUENT	114	97	80	81	64	87
	IN - OUT						
	% REMOVAL	84.7	89.2	91.4	94.4	85.6	89.1
	LOAD -lbs/day						
T S S mg/l	INFLUENT	624	716	744	996	1532	922
	EFFLUENT	7	5	11	4	19	9
	IN - OUT						
	% REMOVAL	98.9	99.3	98.5	99.2	98.8	98.9
	LOAD- lbs/day						
V S S mg/l	INFLUENT	576	608	740	948	1480	870
	EFFLUENT	5	3	7	2	14	6
	IN - OUT						
	% REMOVAL	99.1	99.5	99.1	99.8	99.1	99.3
	LOAD –lbs/day						
Settlable Solids ml/l	INFLUENT	25	38	33	>40	>40	>35
	EFFLUENT	0.0	0.0	0.0	0.1	0.0	0
	IN - OUT						
	% REMOVAL	100	100	100	>97.5	100	>99.5
T O C mg/l	INFLUENT	260	240	195	190	175	212
	EFFLUENT	29	26	25	25	25	26
	IN - OUT						
	% REMOVAL	88.8	89.2	87.2	86.8	85.7	87.7
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

Sheet____ of______

PLANT Palm Springs - N. Subdivision.

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DATE - OFF		1/18	1/19	1/20	1/21	1/22	AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	27.4	27.6	25.1	25.2	26.2	26.3
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	25.2	26.0	24.0	25.0	25.0	25.0
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	2.2	1.6	1.1	0.2	1.2	1.3
	LOAD-lbs/day						
NO_2 -NO_3 as N	CONC.-mg/l	0.2	0.1	0.1	0.5	1.4	.5
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	15.0	13.2	11.7	13.9	14.6	13.7
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	72	67	69	66	68	68
TOTAL COLIFORM	CONC.-MPN/100ml	<18	20	<18	<18	<18	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

Lower Florida Estuary Study
Report on Waterborne Wastes from
Pan American Hospital Waste Water Treatment Plant
5959 N.W. 7th Street
Miami, Dade County, Florida
February 12, 1971

INTRODUCTION

The Pan American Hospital Waste Water Treatment Plant was surveyed during the period December 6 - 11, 1970. The plant is a contact stabilization unit with tertiary treatment. It is owned by the Hospital, but operated under contract by PELCO (Pollution Elimination Corporation). Final effluent flows into the Tamiami Canal. The Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent after chlorination, and daily grab samples for pH, temperature, chlorine residual and total and fecal coliform were collected. Messrs. Terry Davis and George Egermier were sample collectors. Primary contact was Mr. James Barlow of PELCO.

SUMMARY AND CONCLUSIONS

The average five-day biochemical oxygen demand (BOD_5) concentrations in the influent was 209 mg/l and that in the effluent was 5 mg/l. The average load discharged to the Tamiami Canal was 1 lb. per day. The average total suspended solids (TSS) concentrations in the influent and effluent were 248 and 65 mg/l respectively.

The average chlorine residual in the effluent was 3.4 mg/l. The median total and fecal coliform concentrations were both 18 MPN per 100 ml and a high total coliform concentration of 130 MPN per 100 ml was observed.

The proposed State of Florida performance criteria requires 90% treatment. The plant met this requirement for BOD_5 with an average removal efficiency of 97.8%. The requirement was not met for TSS since the average removal efficiency was 60.1%. After our study of the plant, procedures to correct the solids problem were being investigated. The average removal efficiencies and loadings were calculated from the daily values.

It is recommended that the following be instituted:

1. The installation of a flow measuring device.
2. The installation of an additional holding tank for the influent.

INVENTORY

The system consists of the following:

1. Holding tank. This is a 5,000 gallon tank with nominal aeration. It is utilized as a surge tank during peak loading periods.
2. Contact stabilization tanks. Seven small tanks in parallel.
3. Final clarifier.
4. Equalizer tank.
5. Chlorine contact chamber.
6. Jetflo tertiary treatment system.

DISCUSSION OF RESULTS

There is no flow meter at the Pan American Hospital Waste Water Treatment Plant and the design flow of 0.036 MGD was used to calculate the waste loads discharged into the Tamiami Canal.

The average influent and effluent BOD_5 concentrations during the study period were 209 and 5 mg/l respectively, and with an average removal efficiency of 97.8%, one lb. per day was discharged to the Canal. The plant also had average removal efficiencies of 92.2% for chemical oxygen demand and 88.3% for total organic carbon.

Total suspended solids removal was extremely erratic and removal efficiencies ranged from 6.9% to 93.7% for an average of 60.1%. This problem appears to be due to a floc formed in the chlorine after the contact chamber. An attempt to eliminate this problem by chlorinating prior to the tertiary treatment unit filter will be initiated if the problem continues. The average removal efficiency of settleable solids was 99.5%.

The effluent of this plant was highly nitrified and an average of 4 lbs. per day of nitrite-nitrate nitrogen were discharged at an average concentration of 12.4 mg/l. Practically no organic or ammonia nitrogen were discharged. The average total phosphorus concentration in the effluent was 2.1 mg/l for an average load of less than one lb. per day.

The average chlorine residual in the effluent was 3.4 mg/l and the median total and fecal coliform concentrations were both 18 MPN per 100 ml. However, on December 11, 1970, the chlorine residual was low at 0.4 mg/l and a relatively high concentration of coliform bacteria, 130 MPN per 100 ml, was present. Since these wastes are produced in a hospital the occurrence of relatively high concentrations of bacteria in the effluent should be eliminated.

DISCUSSION

This plant has had a background of operational difficulties. The primary problem was the high peak loading, which precluded stabilization of operation. PELCO recommended installation of the present holding tank, which has been an aid in stabilization. However, at peak loads, this holding tank is insufficient. Approximately 6,000 gallons of raw sewage must be trucked daily to the Virginia Key facility, at a cost of approximately $1,500 per month. It is recommended that a larger holding tank be installed to eliminate the need for hauling excess raw sewage. With present operating personnel, and the apparent ability of the Hospital to withstand the cost of operation, the plant operation is excellent. However, loss of ability to fund the operation or degradation of operational quality, could cause these operational difficulties to reappear.

There was evidence of a light whitish floc in the effluent, which accounts for the low suspended solids removal. The floc is formed in the chlorine contact chamber. Mr. Barlow had plans to chlorinate the effluent prior to entry into the tertiary treatment system. This procedure might cause the floc to be removed in the filter system, which is a part of the tertiary treatment system. On January 14, 1971, this matter was discussed with Mr. Barlow by telephone. Mr. Barlow stated that he had made necessary equipment change to accomplish chlorination prior to the tertiary system but had not begun the operation, since there had been no further incidence of the floc.

LAWRENCE W. OLINGER

ROBERT L. KING

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Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 9, 1970

PLANT NAME: Pan American Hospital Waste Water Treatment Plant

PLANT OWNER: Pan American Hospital

ADDRESS 5959 N.W. 7th Street, Miami, Florida

TELEPHONE

COLLECTION SYSTEM – TYPE: Separate

OWNER: Same

ADDRESS:

TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 0.036 MGD YEAR COMPLETED: 1970

STREAM FLOW cfs DURATION days FREQUENCY Yrs

CONSTRUCTION COST $65,000

POPULATION SERVED

OPERATION ANNUAL COST $12,000 for labor plus $18,000 for septic tank trunks.

PERSONNEL Operated by PELCO (Pollution Elimination Corp.) as part of other functions.

LEVEL OF CERTIFICATION C

CONDITION OF EQUIPMENT Good

OUTFALL TYPE SIZE LENGTH

DISCHARGED TO: Tamiami Canal WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Holding tank, contact stabilization, final clarifier, jet-flow tertiary system.

SLUDGE TREATMENT None

DISPOSAL When needed, hauled to Virginia Key

REMARKS

ARED BY:

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Pan American Hospital

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES

Aeration Tank
Aeration Tank
Aeration Tank
Aeration Tank

PREPARED BY:

Sheet 3 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT - DATA SUMMARY

PLANT Pan Am. Hosp

DATE - OFF		12/7	12/8	12/9	12/10	12/11	AVERAGE
FLOW - MGD *		0.036	0.036	0.036	0.036	0.036	—
5 DAY BOD mg/l	INFLUENT	256	170	172.9	209.6	236	209
	EFFLUENT	8.8	2.1	6.3	4.3	4.8	5
	IN - OUT		169.9	166.6	205.3		
	% REMOVAL	96.6	99.9	96.4	97.9	98.0	97.8
	LOAD-lbs/day	3	0	2	1	1	1
COD mg/l	INFLUENT	589	571	648	650	698	631
	EFFLUENT	36	79	44	41	41	48
	IN - OUT	553	492	604	609	657	
	% REMOVAL	93.9	86.2	93.2	93.7	94.1	92.2
	LOAD -lbs/day	11	24	13	12	12	14
TSS mg/l	INFLUENT	136	34	412	216	440	248
	EFFLUENT	20	25	26	201	53	65
	IN - OUT	116	9	386	15	387	
	% REMOVAL	85.3	26.5	93.7	06.9	88	60.1
	LOAD- lbs/day	6	8	8	60	16	20
VSS mg/l	INFLUENT	12	14	272	52	320	134
	EFFLUENT	8	21	24	50	43	29
	IN - OUT	4		248	2	277	
	% REMOVAL	33.3	-	91.2	03.9	86.6	53.8
	LOAD -lbs/day	2	6	7	15	13	9
Settlable Solids ml/l	INFLUENT	8	5	34	16	11	15
	EFFLUENT	nil	nil	nil	.4	nil	<.1
	IN - OUT	8	5	34	15.6	11	
	% REMOVAL	100	100	100	97.5	100	99.5
TOC mg/l	INFLUENT	113	80	167.5	107.5	140	121.6
	EFFLUENT	7	12.5	12	17.5	18.5	13.5
	IN - OUT	106	~~67.5~~ 67.5	155.5	90	121.5	
	% REMOVAL	93.8	84.4	92.8	83.7	86.8	88.5
	LOAD - lbs/day	2	4	4	5	6	4

INFLUENT BOD POPULATION EQUIVALENT =________

EFFLUENT BOD POPULATION EQUIVALENT =________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* PLANT DESIGN FLOW

**From The Desk Of
Michael V. Polito**

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Pan Am Hosp

DATE - OFF		12/7	12/8	12/9	12/10	12/11	AVERAGE or MEDIAN*
FLOW - MGD		0.036	0.036	0.036	0.036	0.036	0.036
KJELDAHL NITROGEN as N	CONC.-mg/l	1.4	1.4	1.7	2.2	2.8	1.9
	LOAD-lbs/day	0	0	1	1	1	1
AMMONIA NITROGEN as N	CONC.-mg/l	0.2	1.0	0.3	1.6	0.4	0.7
	LOAD-lbs/day	0	0	0	0	0	0
ORGANIC NITROGEN as N	CONC.-mg/l	1.2	0.4	1.4	0.6	2.4	1.2
	LOAD-lbs/day	0	0	0	0	1	0
NO_2 -NO_3 as N	CONC.-mg/l	20.0	12.2	11.0	9.8	8.8	12.4
	LOAD-lbs/day	6	4	3	3	3	4
TOTAL PHOSPHORUS AS P	CONC.-mg/l	1.6	2.5	1.3	4.5	0.8	2.1
	LOAD-lbs/day	0	1	0	1	0	0
CHLORIDE	CONC.-mg/l	138	86	121	122	125	118.4
TOTAL COLIFORM	CONC.-MPN/100ml	<18	<18	<18	<18	130	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

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PLANT PANAM, Hosp.

DATE ON		6 Dec 70	8 Dec 70	8 Dec 70	9 Dec 70	10 Dec 70	AVERAGE
TIME ON		0820	0937	0936	1013	1047	
DATE OFF		7 Dec 70	8 Dec 70	9 Dec 70	10 Dec 70	11 Dec 70	
TIME OFF		0937	0934	1013	1047	1025	
FLOW	START	–	–	–	–	–	
	END	–	–	–	–	–	
	TOTAL	–	–	–	–	–	
	24 hr. Flow Rate	–	–	–	–	–	
INF.	TEMP. ON	27.8°C	27.0°C	29.7°C	29.4	28.4	28.5
	PH - ON	8.34	7.1	6.7	–	* ~~10.6~~ 7.1	7.3
EFFLUENT	TEMP - ON	23.7°C	24.5°C	24.9°C	25.8°C	26.0°C	25.0
	PH - ON	3.6	5.13	7.25	–	* ~~10.4~~ 6.94	5.7
	Cl. Residual	7.5	4.0 EST	4.0 EST	1.0	.4 EST.	3.4
	CHLORINE-ON	–	–	–	–	–	
	CHLORINE-OFF	–	–	–	–	–	
	ON-OFF-lbs	–	–	–	–	–	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
6 Dec 70	Normal/clear	1 aerator down		GAE
7 Dec 70	Small round + oblong white solids NORMAL/CLEAR	1 AERATOR down SEE REVERSE	2 INF. BLANK 20 EFF BLANK 15 " SHORT. 10+11 INF Tripped at same time	GAE
8 Dec 70	Light GRN. Turbid with small, round floc. Suds in CL2 chamber	1 AERATOR down White scum on sides of CL2 CONTACT CHAMBER.	16 EFF – 110 ML.	GAE
9 Dec 70	EFF. CLEAR with EVENLY dispersed loosely compacted (fluffy) floc. Can see thru solids	ALL AERATOR OPERATING Suds in CL2 CHANNEL	OVER	GAE
10 Dec 70	SAME EXP. LESSER ~~AMT~~ AMOUNT.	Suds in CL2 Channel Seperate inf. not sampled is colored light GREEN/BLUE. 24 Inf – 90 mL	OVER	GAE GAE
11 Dec 70	NORMAL	NORMAL	OVER	GAE
*	Ph corrected due to meter reading high Davis			

Lower Florida Estuary Study
Report on Waterborne Wastes from
Peninsular Utilities Waste Water Treatment Plant
S. W. 97th Avenue and Kendall Drive
(Owned by General Waterworks Corporation)
1826 Ponce de Leon Boulevard
Coral Gables, Dade County, Florida
February 4, 1971

INTRODUCTION

The Peninsular Utilities plant was surveyed during the period December 13 - 18, 1970. The plant is a contact stabilization unit with final effluent presently flowing into Snapper Creek. Early in 1971, the effluent disposal will be accomplished by deep-well injection. The serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent before chlorination. Messrs. Terry Davis and George Egermier were sample collectors. Primary contacts were Messrs. A. E. Legall, Jr., and Steve Yateman, of General Waterworks Corporation.

SUMMARY AND CONCLUSIONS

The flow measurement device was not in operation during the study. The average flow reported by the plant of 2.5 MGD, was used to determine the waste loads. The average influent five-day biochemical oxygen demand (BOD_5) was 230 mg/l and the average discharge loading was 502 lbs. per day at an average concentration of 24 mg/l. The average influent and effluent total suspended solids (TSS) concentrations were 365 and 41 mg/l, respectively. The average chlorine residual in the effluent was 4.4 mg/l and it was effectively chlorinated.

The proposed State of Florida performance criteria requires 90%

treatment. This criteria was met for BOD_5 with an average efficiency of 90% and a minimum value of 87%. This plant does not meet the TSS criteria with a removal efficiency of 89% and a minimum value of 86%. The average removal efficiencies were calculated from the daily removal efficiencies.

The only recommendation for this plant is that the flow meter be repaired as soon as possible.

INVENTORY

In the present operating configuration, major components are:

1. Comminutor.
2. Primary clarifier.
3. Two-cell contact tank with flow of sludge to a stabilization tank and recycling to the contact tank.
4. Two circular secondary clarifiers in parallel.
5. Chlorine contact chamber.
6. Pump chamber, and then to Snapper Creek.
7. Sludge flows to a waste sludge thickener (formerly a primary clarifier) and then to a two-stage aerobic digester. Sludge from the digesters is either trucked to Virginia Key or sent to drying beds.

DISCUSSION OF RESULTS

The flow meter was not in operation at this plant, hence, the average flow of 2.5 MGD reported in "Status Report for Sewage Treatment Plants in Dade County," September 1970 was used to calculate the loads discharged by the plant.

The average influent BOD_5 at this plant was 230 mg/l and the average effluent BOD_5 was 24 mg/l. The average BOD_5 removal efficiency was 90%, and 502 lbs. per day were discharged to Snapper Creek during the study period. The chemical oxygen demand (COD) and total organic carbon (TOC) tests were used in addition to the BOD_5 test to determine the pollutional strength of this waste. The removal efficiencies of COD and TOC for this plant were 87% and 85%, respectively. Also the effluent contained 1656 lbs. per day of COD and 406 lbs. per day of TOC.

The average TSS removal efficiency was 89%, with values ranging from 86 to 93%. The average influent TSS concentration was 365 mg/l and that in the effluent was 41 mg/l. The plant discharged an average of 701 lbs. per day of volatile suspended solids and 146 lbs. per day of fixed suspended solids. The average settleable solids removal was 99.6%.

The bulk of the nitrogen discharged by this plant was in the form of ammonia nitrogen with an average concentration and loading of 19.4 mg/l and 405 lbs. per day, respectively. Practically no organic nitrogen and nitrite-nitrate nitrogen were discharged. An average of 195 lbs. per day of total phosphorus was discharged at 9.5 mg/l.

The average chlorine residual in the effluent was 4.4 mg/l and as expected the effluent was satisfactorily disinfected.

Daily values are presented on the attached Field and Data Summary sheets.

DISCUSSION OF OPERATION

General appearance of the plant is excellent. "Housekeeping" and mechanical maintenance were good during the period. Visual appearance of the effluent was not the best observed thus far during the program, but was adequate. The principle problem in plant operation is the disposal of large volumes of waste sludge. At present, approximately 120,000 gallons of sludge is trucked daily to the Virginia Key plant. There was no flow recording device in operation during the survey. However, an effort was being made to repair the existing device.

ROBERT L. KING

LAWRENCE W. OLINGER

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Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 17, 1970
PLANT NAME: Peninsular Utilities (Snapper Creek)
PLANT OWNER: General Waterworks Corporation
ADDRESS 1826 Ponce de Leon Boulevard, Coral Gables, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 2 to 3.0 MGD YEAR COMPLETED: 1970
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED 7,330 equivalent connections (≈ 25,655 population).

OPERATION ANNUAL COST No data.
PERSONNEL 4 operators, 3 laborers, 1 lab technician, 2 lift station operators.
LEVEL OF CERTIFICATION "C" for all operators.
CONDITION OF EQUIPMENT Excellent
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Snapper Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Comminutor, primary clarifier, contact stabilization unit, 2 secondary clarifiers (in parallel), chlorine contact chamber.

SLUDGE TREATMENT Sludge thickening tank, two stage aerobic digestion.

DISPOSAL Trucked to Virginia Key.

REMARKS

PREPARED [illegible]

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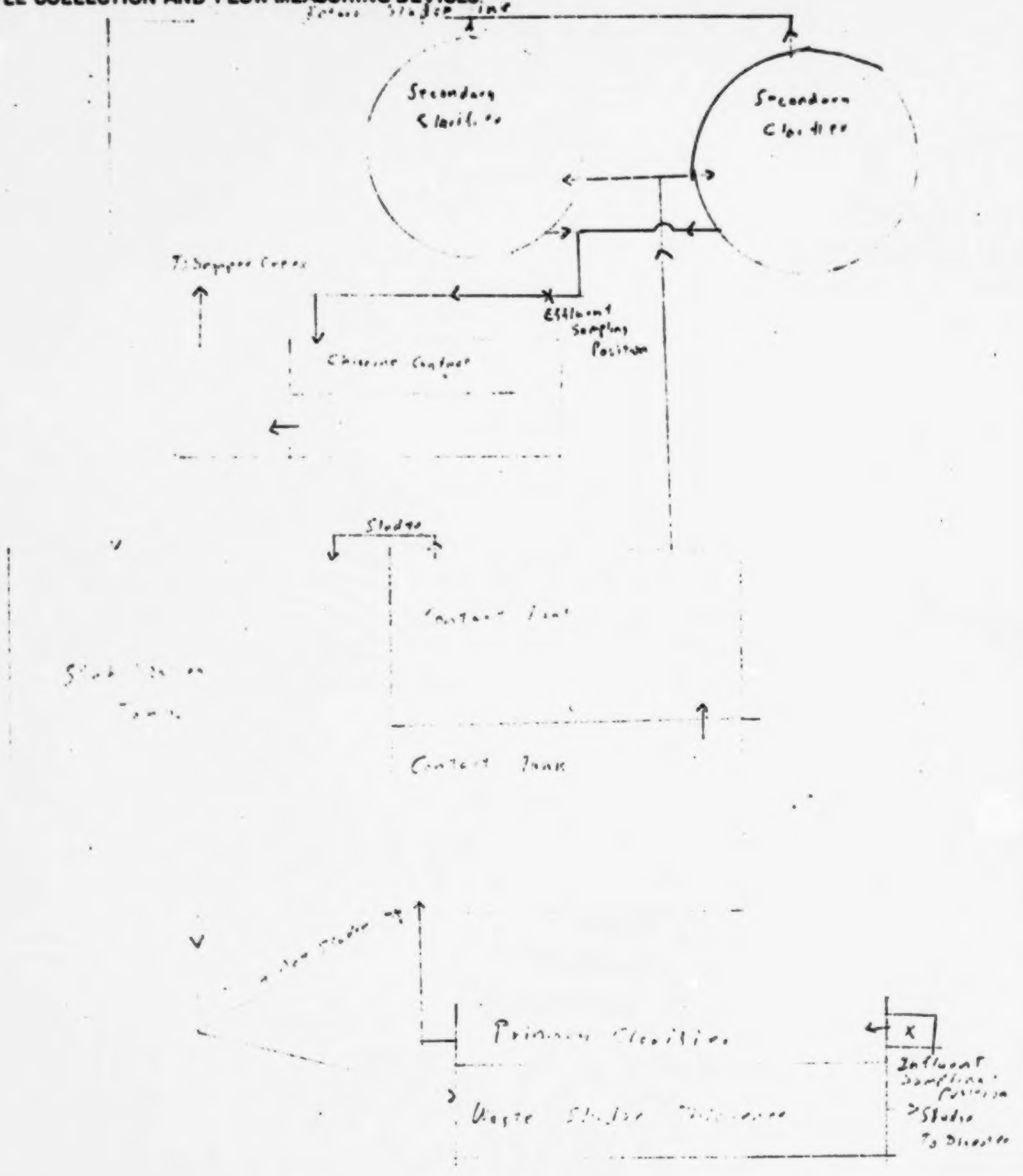
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT PENINSULAR UTILITIES

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES.


Return Sludge line
Secondary Clarifier
Secondary Clarifier
To Snapper Creek
Effluent Sampling Position
Chlorine Contact
Sludge
Contact Tank
Stabilization Tank
Contact Tank
Primary Clarifier
X
Influent Sampling Position
Waste Sludge Thickener
Sludge To Digester

PREPARED BY Robert L. King

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Sheet 3 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT (Pena STP) Geo. Warren Wacks. (Snapper Creek)

DATE - OFF		12/14/70	12/15	12/16/	12/17	12/18	AVERAGE
FLOW - MGD		2.5 *	2.5	2.5	2.5	2.5	
5 DAY B O D mg/l	INFLUENT	271	226	215	221	219	220
	EFFLUENT	27	27	20.4	28	17.9	24.1
	IN - OUT						
	% REMOVAL	90.0	88.1	90.5	87.3	91.8	89.5
	LOAD-lbs/day	563	563	425	584	373	502
C O D mg/l	INFLUENT	1123	728	495	629	419	679
	EFFLUENT	81	[illegible]	70	80	86	79.4
	IN - OUT						
	% REMOVAL	92.9	89.0	85.9	87.3	79.5	86.9
	LOAD -lbs/day	1689	1668	1460	1668	1793	1656
T S S mg/l	INFLUENT	444	3[illegible]6	[illegible]	348	244	365
	EFFLUENT	60	54	[illegible]	34	26	41
	IN - OUT						
	% REMOVAL	86.5	86.6	93.0	90.2	89.3	89.9
	LOAD- lbs/day	1251	1126	605	709	542	84.7
V S S mg/l	INFLUENT	424	[illegible]	[illegible]	332	208	[illegible]
	EFFLUENT	56	49	[illegible]	28	14	33.6
	IN - OUT						
	% REMOVAL	86.9	[illegible]	94.4	91.6	93.4	90.6
	LOAD —lbs/day	1168	1022	438	584	292	701
Settlable Solids ml/l	INFLUENT	10	.3	[illegible]	7	8	7.0
	EFFLUENT	0.0	0.0	.1	.1	0.0	<.1
	IN - OUT						
	% REMOVAL	100	100	99.0	97.9	100	99.6
T O C mg/l	INFLUENT	195	87.5	160	125	142.5	142.0
	EFFLUENT	20.5	17.5	19	25	15.5	19.5
	IN - OUT						
	% REMOVAL	89.5	80.0%	88.1	80.0	[illegible]	[illegible]
	LOAD - lbs/day	427	365	396	521	323	406

INFLUENT BOD POPULATION EQUIVALENT =

EFFLUENT BOD POPULATION EQUIVALENT =

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* AVERAGE FLOW REPORTED BY DADE CO., SEPT 1970 INVENTORY

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Michael V. Polito
MVP

Sheet 4 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Penn STP/Gen Water Works

DATE - OFF		12/14	12/15	12/16	12/17	12/18	AVERAGE or MEDIAN*
FLOW - MGD		2.5	2.5	2.5	2.5	2.5	
KTELDAHL NITROGEN as N	CONC.-mg/l	22.1	20.5	20.2	18.8	20.7	20.5
	LOAD-lbs/day	461	427	421	392	432	427
AMMONIA NITROGEN as N	CONC.-mg/l	21.6	19.2	18.8	18.8	18.8	19.4
	LOAD-lbs/day	450	400	392	392	392	405
ORGANIC NITROGEN as N	CONC.-mg/l	0.5	1.3	1.4	—	1.9	1.3
	LOAD-lbs/day	10	27	29	—	40	27
NO_2 -NO_3 as N	CONC.-mg/l	0.02	0.04	0.02	0.02	0.02	.02
	LOAD-lbs/day	0	1	0	0	0	0
TOTAL PHOSPHORUS AS P	CONC.-mg/l	11.7	10.4	7.3	9.0	8.4	9.4
	LOAD-lbs/day	244	217	152	188	175	195
CHLORIDES	CONC.-mg/l	[illegible]	[illegible]	34	40	20	36.4
TOTAL COLIFORM	CONC.-MPN/100ml	<18	78	<18	-	< 18	<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	<18	<18	—	< 18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

Sheet 5 of 5

PLANT (Penn. S.T.P.) Gen. WATER WORKS

							AVERAGE
DATE ON		13 Dec 70	14 Dec 70	15 Dec 70	16 Dec 70	17 Dec 70	
TIME ON		0800	0750	0730	0755		
DATE OFF		14 Dec 70	15 Dec 70	16 Dec 70	17 Dec 70	18 Dec 70	
TIME OFF		0750	0730	0755		0730	
FLOW	START	–	–	–	–	–	
	END	–	–	–	–	–	
	TOTAL	–	–	–	–	–	
	24 hr. Flow Rate	–	–	–	–	–	
INF.	TEMP. ON	24.1°C	24.1°C	24.1°C	27.0°C	26.5°C	26.1
	PH - ON *	9.9	9.8	7.24	7.2	7.18	8.3 *
EFFLUENT	TEMP - ON	25.2°C	24.4°C	25.4°C	26.5°C	24.3°C	25.2
	PH - ON *	9.7	9.8	7.14	7.2	6.75	8.1 *
	Cl. Residual	5.0	3.5 est	5.0	2.5	6.0 est	4.4
	CHLORINE-ON	–	–	–	–	–	
	CHLORINE-OFF	–	–	–	–	–	
	ON-OFF-lbs	–	–	–	–	–	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
13 Dec 70	NORMAL	one primary clarifier not being used suds in PLT	19 INF Tripp	–
14 Dec 70	NORMAL	unused primary filled. suds in plant	19 inf empty 19 eff blank	GAE
15 Dec	NORMAL small white (grease) specks	primary set used as clarifier now, pumped out. suds in PLT (over)	[illegible]	GAE
16 Dec 70	NORMAL white specks	NORMAL	O.K.	GAE
17 Dec 70	Normal	Normal	ok	LAW.
18 Dec 70	NORMAL	NORMAL	EFF #5 - DRY	GAE

* - ~~Dt~~ Ph for first two days may be erroneous

LOWER FLORIDA ESTUARY STUDY

Report on Waterborne Wastes From
Redlands Farm Labor Camp Wastewater Treatment Plant
Housing Authority of the City of Homestead
P. O. Box 278
Homestead, Dade County, Florida
March 22, 1971

INTRODUCTION

The Redlands Farm Labor Camp wastewater treatment plant was surveyed during the period January 10-15, 1971. The plant is a trickling filter system with a microstrainer as additional treatment. The effluent flows into sand filters and subsequently into ground water. Serco automatic samplers were utilized to collect 24-hour composites of influent and effluent after chlorination. Messrs. Terry Davis and Joe Hopson were sample collectors. Primary contacts were Messrs. George Eicher, Executive Director, and Raymond P. Smith, Maintenance Supervisor and Assistant to the Director, of the Homestead Housing Authority.

SUMMARY AND CONCLUSIONS

The average flow measured during the study was 0.057 MGD. However, this is not representative of the actual flow since the flow meter is located "down/ stream" from a return line from the microstrainer to the primary clarifier. Therefore, actual flow is somewhat less than this value. The average five-day biochemical oxygen demand (BOD) of the influent and effluent, for the last two days of sampling, were > 969 and 21 mg/l respectively. The average total suspended solids (TSS) in the influent and effluent were 1332 and 48 mg/l, respectively. The average chlorine residual for the five days of sampling was greater than 2.3 mg/l, and the effluent was effectively disinfected.

The Redlands Labor Camp wastewater treatment plant removed more then 90 percent of all parameters measured, except settleable solids. This criteria was met for BOD with an average removal of greater than 96.6 percent, for TSS with an average removal of 96 percent, for chemical oxygen demand (COD) with an average removal of 96.3 percent, for volatile suspended solids (VSS) with an average removal of 96.6 percent, and for total organic carbon (TOC) with an average removal of 94.9 percent. The average removal efficiency for settleable solids (SS) was 86 percent. These average values were calculated from the daily values.

The following recommendations are made to improve plant operation:

1. That flow meters be located so that no re-circulated flow is measured.
2. That plant design be reviewed to effect simplification of operating procedures, or that staffing requirements be re-evaluated to insure that adequately trained operating personnel are available.
3. That fencing be constructed around the sand filter beds to deny access to inhabitants of the Labor Camp.

INVENTORY

No specific design information was provided for this plant. The major components are:

1. Imhoff tank, which was originally designed to function as both the clarifier and the digester, but is now used only as a digester. Sludge is drawn from the system to a small aerobic digester.

2. Trickling Filter
3. Secondary Clarifier
4. Microstrainer
5. Chlorine Contact Chamber
6. Sand Filter Beds

DISCUSSION OF RESULTS

The average flow at the Redlands Farm Labor Camp was 0.057 MGD during the survey, and the design flow is 1.00 MGD. However, flow measurement is inaccurate, since the flow meter is located between the secondary clarifier and the microstrainer, and there is a return line from the microstrainer to the primary clarifier. There is also a return line from the secondary clarifier to a point in the influent line prior to entry into the Imhoff primary clarifier. This fact was not discovered until the third day of the survey. On the fourth and fifth day of the survey, the influent sampling position was changed to eliminate the dilution of the influent from this return flow.

The pollutional strength of the waste was measured utilizing the BOD, COD, and TOC analyses. As stated above, the average BOD of the influent and effluent was > 969 mg/l and 21 mg/l, respectively, but the effluent concentration for the entire 5 days of sampling was 18 mg/l. The average BOD removal efficiency during the latter two days of the survey was > 96.6 percent and an average of 26 lbs/day of BOD was discharged. The average removal efficiencies of COD and TOC for the last two days of the survey were 96.3 and 94.9 percent, respectively.

The influent and effluent total suspended solids concentrations for the last two days of the survey averaged 1332 and 48 mg/l respectively, and the average removal efficiency was 96 percent. Over the entire survey period, the average effluent concentration was 34 mg/l and the plant discharged an average of 43 lbs./day of suspended solids. Settleable solids removal was 86 percent for the last two days of the survey.

Nutrients discharged by this plant were principally in the form of nitrite and nitrates, 13 lb/day, and total phosphorus, 11 lbs./day.

The average chlorine residual for the entire survey was greater than 2.3 mg/l, and the median total and fecal coliform concentrations both were less than 18 mpn per 100 ml. The daily values for all parameters are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

The initial attempt to survey this plant was made on January 3, 1971. At the time the samplers were installed, the plant was obviously hydraulically overloaded, as evidenced by excess flow over the weirs of the secondary clarifier. The plant operator stated that this condition occurred periodically. Upon arrival the morning of January 4, there was a sufficient overload on the plant to cause raw sewage to flow over the top of the Imhoff clarifier. It was discovered that the constant flow of the recirculating pump, combined with a surge in influent, caused the overflow condition. This condition was corrected by turning off the recirculating pump during high flow periods. While this condition was being investigated, sampling was discontinued, and then re-initiated during the period January 10-15, 1971. During this period, it was discovered that the influent sampling position was not representative of the raw influent. Samplers had originally been set up at the influent to the Imhoff primary clarifier, but there was a return line from the secondary clarifier which entered upstream from this position. On the final two days of sampling, the influent samplers were changed to a manhole in order to measure the true influent.

General appearance of the plant was fair, but "housekeeping" and mechanical maintenance was poor. Visual appearance of the effluent was poor, although laboratory analyses indicate a high removal efficiency for both BOD and suspended solids. There is no apparent odor in the vicinity of the plant, even at relatively high ambient temperature, although visual appearance of the Imhoff clarifier would suggest a possibility for a highly odorous condition.

While not of direct concern to the survey, a condition was observed which should be corrected. The sand filters are immediately adjacent to some of the camp housing units. Small children and camp animals were observed traversing the sand filter beds, which could cause direct exposure to the effluent from this plant.

The principal problems in this plant are lack of personnel and poor plant design. Mr. Smith, with the help of one laborer, operates this plant and the South Dade Farm Labor Camp plant on a part time basis. It is questionable whether the maintenance observed during the survey was routine, since the laborer spent the bulk of his time at this plant during the survey but moved to the South Dade Labor Camp during the period when sampling was conducted at that plant. Operating personnel are not well trained in plant operation, as is reflected in the general confusion when problems arose. The design of these plants is poor. The flow meters are located such that they record a portion of the re-circulated flow from the microstrainer. These meters should be re-located downstream from the chlorine contact chamber. The operator feels that hydraulic overloading is caused, in part, by the fact that the microstrainer is not designed with sufficient capacity to treat surge hydraulic loads. The entire plant design should be reviewed to insure proper sizing of all components, since it appears that an extraordinary amount of re-circulation is necessary for proper plant operation.

Robert L. King

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Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 13, 1971
PLANT NAME: RedlandsFarm Labor Camp wastewater treatment plant
PLANT OWNER: Housing Authority of the City of Homestead
ADDRESS: P. O. Box 278, Homestead, Florida
TELEPHONE:
COLLECTION SYSTEM – TYPE: Separtate
OWNER: same as above
ADDRESS:
TELEPHONE:

SIZE: AVERAGE DESIGN FLOW: 0.100 MGD MGD YEAR COMPLETED:
MINIMUM FLOW c/s DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED 12,050

OPERATION ANNUAL COST
PERSONNEL One part-time operator plus 1 part-time laborer
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair
OUTFALL TYPE SIZE LENGTH
DISCHARGES TO: Sand Filters WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Imhoff clarifier, trickling filter, secondary clarifier, microstrainer, chlorine contact chamber, sand filters.

SLUDGE TREATMENT Aerobic digester

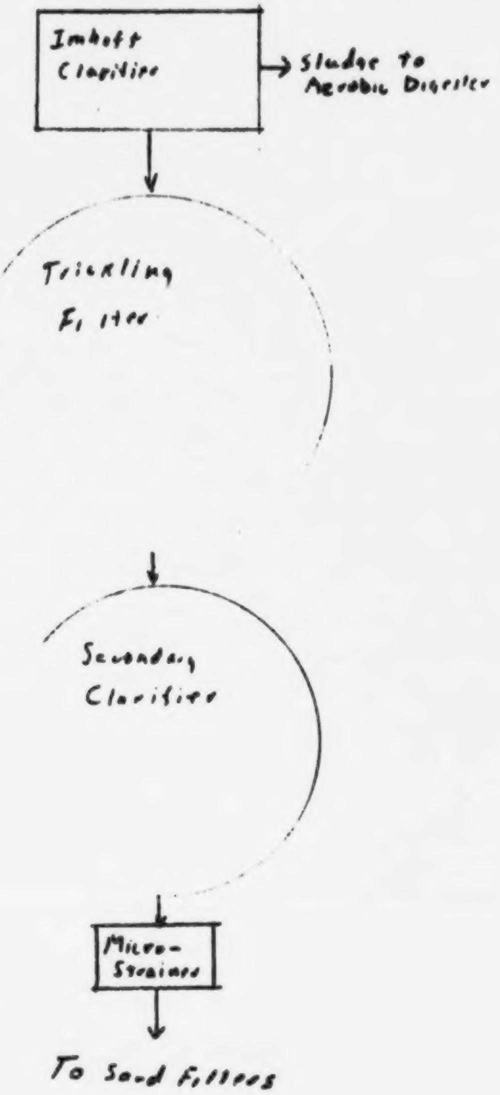
Reproduced from best available copy.

DISPOSAL sludge drying beds

REMARKS

PREPARED BY:

Redlands Farm Labor Camp.


Imhoff Clarifier
Sludge to Aerobic Digester
Trickling Filter
Secondary Clarifier
Micro-Strainer
To Sand Filters

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Sheet ___of___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Redland Labor Camp STP

DATE - OFF		1/11/71	1/12/71	1/13	1/14	1/15	AVERAGE
FLOW - MGD		.150					
5 DAY BOD mg/l	INFLUENT	237	111	110	>1590	348	>479
	EFFLUENT	9	18	22	23.5	18.4	18
	IN - OUT						
	% REMOVAL	96.2	83.8	80.0	>98.5	94.7	> 90.6
	LOAD-lbs/day	11	23	28	29	23	22.8
COD mg/l	INFLUENT	623	321	415	2384	1339	1016
	EFFLUENT	55	64	67	66	63	63
	IN - OUT						
	% REMOVAL	91.2	80.1	83.8	97.2	95.3	89.5
	LOAD -lbs/day	~~14~~ 67	80	84	83	79	~~68~~ 79
TSS mg/l	INFLUENT	372	194	166	1860	804	679
	EFFLUENT	16	14	46	56	40	34
	IN - OUT						
	% REMOVAL	95.7	92.8	72.3	97.0	95.0	90.6
	LOAD- lbs/day	20	18	58	70	50	43
VSS mg/l	INFLUENT	312	168	154	1860	764	652
	EFFLUENT	12	13	34	52	30	28
	IN - OUT						
	% REMOVAL	96.2	92.3	77.9	97.2	96.1	91.9
	LOAD - lbs/day	15	16	43	65	38	35
Settlable Solids ml/l	INFLUENT	6	5	16	13	3	9
	EFFLUENT	.1	.3	.5	1.0	.6	.5
	IN - OUT						
	% REMOVAL	98.3	94.0	96.9	92.3	80.0	92.3
TOC mg/l	INFLUENT	100	65	70	760	175	234
	EFFLUENT	20	13	20	21	13	17
	IN - OUT						
	% REMOVAL	80.0	80.0	71.4	97.2	92.6	84.2
	LOAD - lbs/day	25	16	25	26	16	22

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released

From The Desk Of
Michael V. Polito MVP

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

Sheet____ of______

PLANT Redland Labor Camp STP

DATE - OFF		1/11	1/12	1/13	1/14	1/15	AVERAGE or MEDIAN*
FLOW - MGD		.150	—			→	
KTELDAHL NITROGEN as N	CONC.-mg/l	4.7	4.0	4.1	3.8	5.2	4.4
	LOAD-lbs/day	6	5	5	5	7	6
AMMONIA NITROGEN as N	CONC.-mg/l	2.8	1.6	2.8	2.2	2.1	2.3
	LOAD-lbs/day	4	2	4	3	3	3
ORGANIC NITROGEN as N	CONC.-mg/l	1.9	2.4	1.3	1.6	3.1	2.1
	LOAD-lbs/day	2	3	2	2	4	3
NO_2 -NO_3 as N	CONC.-mg/l	9.5	12.2	9.6	10.0	11.5	10.6
	LOAD-lbs/day	12	15	12	13	14	13
TOTAL PHOSPHORUS AS P	CONC.-mg/l	6.1	6.6	6.9	19.3	6.2	9.0
	LOAD-lbs/day	8	8	9	24	8	11
CHLORIDE	CONC.-mg/l	43	40	40	46	46	43.0
TOTAL COLIFORM	CONC.-MPN/100ml	170	<18	<18	<18	<18	<18
Fecal COLIFORM	CONC.-MPN/100ml	20	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Redland Labor Camp STP

DATE ON		10 Jan 71	11 Jan 71	12 Jan, 71	13 Jan, 71	14 Jan, 71	AVERAGE
TIME ON		10:15	11:00	11:00	1030	1045	
DATE OFF		11 Jan, 71	12 Jan 71	13 Jan 71	14 Jan, 71	15 Jan 71	
TIME OFF		11:00	11:00	1030	1045	1045	
FLOW	START	13890					
	END	—					
	TOTAL		3¾"	3 ¼"	2⅞"	3¼"	
	24 hr. Flow Rate		.086 mgd	.061 mgd	.021	.061 mgd	.05725
INF.	TEMP. ON	25.5	26	26	25.2	25	25.5
	PH - ON	7.4	7.5	7.2	7.1	7.2	7.3
EFFLUENT	TEMP - ON	25.5	25.5	25.4	25	25	25.3
	PH - ON	7.4	7.6	7.6	6.8	7.0	7.3
	Cl. Residual	>2.5	2.5	>2.5	1.5	2.5	>2.3 OK
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
11 Jan, 71	Normal	* Normal - totalizator or flow meter not working	Eff ~~no~~ blank Inf #5 - 80 ml	
12 Jan, 71	Normal suspen. solids in Eff.	* Normal	OK	
13 Jan, 71	same as above	Normal - few holes more trickle arms open	OK	
14 Jan, 71	several influent samples were almost pure feces [illegible]	* Normal	Inf. #17 - 70 ml 14 - 50 21 - 80 4 - 80 7 - 50 3 - 60	
cont				
15 Jan, 71	Normal	* Normal	Inf. #18 - 40 ml 7 - 60 5 - 70 10 - [illegible]	

13 Jan - Moved influent sampler to lift station to obtain pure raw sewage - other location gave combination of treated and raw sewage.

* Only 1/4 of opening in trickle arms are putting out.

Lower Florida Estuary Study
Report on Waterborne Wastes from Riverdale Estates Waste Water Treatment Plant

(Owned by Ecological Utilities, Inc.)
3150 N. W. 208th Terrace
Miami, Dade County, Florida
January 11, 1971

INTRODUCTION

The Riverdale Estates Waste Water Treatment Plant was surveyed during the period November 29 through December 4, 1970. The plant is a complete mix activated sludge unit. The final effluent flows into Snake Creek. The Serco automatic samplers were utilized to collect five 24-hour composites of the influent and effluent. Samples of the effluent were collected at each of the two secondary clarifiers. Bacterial, temperature, pH and chlorine residual grab samples were collected from the effluent of the chlorine contact chamber. Messrs. Terry Davis and George Egermier collected the samples. Primary contact for this plant was Mr. William Conlon of Ecological Utilities, Inc.

SUMMARY AND CONCLUSION

The average flow through the Riverdale Waste Water Treatment Plant was 0.36 MGD during the study period. The average influent five-day biochemical oxygen demand (BOD_5) was 456 mg/l, well above the 150 mg/l design criteria, and the effluent BOD_5 was 66 mg/l. An average 190 lbs. per day of BOD_5 were discharged to Snake Creek. Median total and fecal coliform concentrations after chlorination were both <18 MPN per 100 ml. The pH of the effluent averaged 4.6, which is extremely low, and it is suspected that excessive chlorination was the cause of this. The average total suspended solids (TSS) concentration in the influent was 369 mg/l, also higher than design, and that in the effluent was 249 mg/l.

This plant does not meet the Dade County performance criteria for BOD_5 and suspended solids which requires an average removal of 90 percent with no values less than 85 percent. The average BOD_5 removal was 85.6% and the average total suspended solids removal was 32.6%. The average removal efficiency was calculated from the daily removal efficiencies.

The following are recommended to improve the operation of this plant:

1. The installation of an automatic device to improve control of chlorine dosage levels.

2. The operating criteria of the plant should be reevaluated based on higher than predicted influent concentrations.

3. Immediate modification of present operation or installation of additional treatment device to reduce the solids level in the effluent.

INVENTORY

Major components of the plant are:

1. Comminutor located on the east edge of aeration tank, with return sludge line entering downstream from comminutor and immediately before flow into aeration tank. There is a bar screen in parallel with the comminutor, but it was not used during the survey period. The influent stream was sampled downstream from the comminutor and upstream from entrance of the return sludge.

2. The aeration unit is composed of a 220,000 gallon tank with

two mechanical aerators. It is designed to affect 95.5% BOD removal at an incoming flow of 0.875 MGD with BOD and suspended solids concentrations of 150 mg/1. These design criteria were based upon the average flow and sewage concentration for the year 1968.

3. The secondary clarifiers are designed for a continual flow of 0.87 MGD with a four-hour detention time. The north unit was formerly the primary clarifier prior to installation of the aeration unit, which replaced a trickling filter, now out of service.

4. The chlorine contact chamber is designed to provide 30 minutes detention time at 200% of the average flow.

5. The digester was not used during the survey period, as all sludge was being returned to the plant in an effort to increase suspended solids in the aeration unit.

6. Microstrainer to be installed early in 1971.

DISCUSSION OF RESULTS

The design flow of the Riverdale Estates Waste Water Treatment Plant is 0.87 MGD and the average flow during the study period was 0.36 MGD.

Extremely high chlorine residuals, averaging 6.8 mg/1, were observed during the study. Although the effluent was effectively disinfected, the average pH of the discharge, 4.6, indicates over-chlorination. The average pH of the plant influent was 7.5.

The pollutional strength of the waste was measured by the five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), and total organic carbon (TOC) tests. The removal efficiencies of the plant were 85.6 percent for BOD_5, 73.4 percent for COD, and 73 percent for TOC. For every test the lowest efficiency occurred on December 3, 1970, during which no settleable solids were removed by the plant. On the other days of the study, removal of settleable solids ranged from 96 to 99.5 percent and BOD_5 removal averaged 89.4 percent. However, COD and TOC removals only ranged from 74 to 86 percent. The average effluent concentrations of BOD_5, COD, and TOC were 66, 264, and 52 mg/l respectively, and the average loads of BOD_5, COD, and TOC discharge to Snake Creek were 190, 773, and 154 lbs. per day respectively.

Removal of TSS by this plant during the study was extremely poor, because on Both November 30, 1970 and December 1, 1970 higher daily average concentrations occurred in the effluent than in the influent. The following day 80% removal of TSS was accomplished, and on December 3, 1970 the removal efficiency dropped to 27%. A high priority must be given to increasing the solids removal efficiency of this plant.

The average influent BOD_5 and TSS concentrations were 456 and 369 mg/l respectively, which are well above the design concentrations of 150 mg/l for each parameter. Operating criteria of this plant should be reevaluated based upon the higher than predicted influent concentrations.

The nutrient loads, discharged to the stream, were 6 lbs. per day of ammonia nitrogen, 25 lbs. per day of organic nitrogen, 46 lbs. per day of nitrite-nitrate nitrogen and 50 lbs. per day of total phosphorus.

Field and Data Summary Sheets containing daily values are attached.

DISCUSSION OF OBSERVATIONS

General appearance of the plant is good. "Housekeeping" is adequate and mechanical maintenance appeared to be sound during the survey period. The operator is experienced in plant operation and is generally competent. There is a problem of "scum", or heavy foam, in both the aeration tank and the secondary clarifiers. This is being alleviated by a fine spray of water in the secondary clarifiers. There is some carry-over into the chlorine contact tank. However, the primary problem is the excessive chlorination in the contact chamber. There are no automatic controls on chlorine dosage, so the dosage was held at an extremely high level throughout the survey period. There is an odor of chlorine which can be detected some distance downwind from the plant. Apparently, this is standard operating procedure, as the County inspector indicated that chlorine residuals generally were high at this plant and the chlorine odor was almost always present.

LAWRENCE W. OLINGER

ROBERT L. KING

Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Riverdale

		29 Nov 70	30 Nov 70	1 Dec 70	2 Dec 70	3 Dec 70	AVERAGE
DATE ON		29 Nov 70	30 Nov 70	1 Dec 70	2 Dec 70	3 Dec 70	AVERAGE
TIME ON		1100	1405	1300	1200	1027	
DATE OFF		30 Nov 70	1 Dec 70	2 Dec 70	3 Dec 70	4 Dec 70	
TIME OFF		1230	1300	1200	10:27	0911	
FLOW	START	110622000	111051000	111400000	111733000	112011000	
	END	111051000	111400000	111733000	112011000	112372000	
	TOTAL	429,000	349000	333000	278000	361000	
	24 hr. Flow Rate	~~404,000~~	365764	347,488	296,533	380,835	362,171
INF.	TEMP. ~~ON~~ OFF	25.4°C	25.9°C	25.8°C	25.5°C	26.1°C	25.74
	PH ~~ON~~ OFF	7.3	7.45	7.12	7.5	8.18	7.51
EFFLUENT	TEMP ~~ON~~ OFF	24.0	23.6	22.5	23.5°C	22.2°C	23.36
	PH ~~ON~~ OFF	5.7	5.4	4.38	3.52	3.82	4.56
	Cl. Residual	5.0+	10.0−	5.0−	5.0+	9.0 est.	6.80
	CHLORINE-ON	+	−	−	−	−	
	CHLORINE-OFF	−	−	−	−	−	
	ON-OFF-lbs	−	−	−	−	−	

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
29 Nov 70	TurBid	O K.	11+2 Activated	Egermier
30 Nov 70	—	O K.	8+5 Infl. expt. Heavy solids Over →	→
1 Dec 70	TurBid floc, other Large particle	Between 2400 to 0800 for unknown time pumps in So. Clarifier were stuck open	1 - No sample Influent → 4 - Heavy suspended solids - Inf. ~~12+13 Tripped Together~~	
2 Dec, 70			#12+13 Influent tripped at 1115	
3 Dec 70	Eff. TurBid with floc.	O.K. 80mL →	7,5+1 Inf. are empty 18 inf. is partial sample 24 inf is Heavy solids → ~~11 Inf. Tripped at 1000 hrs~~	
~~3 Dec 70~~				
3 Dec 70	Eff - TurBid with Light Green color, floc, small grease ~~balls~~ specks + parts of	Sewage related articles	11 Inf. Tripped AT 1000 hrs. over	
	Heavy foam in aerators →	Heavy surface solids in So. Clarifier No. Clarifier - Liquid over flites	No. Eff. 3+5 BLANK So. Eff. 1,3,5, (also short) 2, 7, 9, 14, 23, 24, 22	
Dec	floc in Effluent color of Light green. Cl2 odor	No Clarifier - liquid over flites	Over	

...ct 100 mL instead of 200 mL for final composite. Heavy Cl2 odor around &

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Riverdale STP

DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE
FLOW - MGD		0.42	0.37	0.35	0.30	0.38	0.36
5 DAY B O D mg/l	INFLUENT	425	373	408	487	589	456
	EFFLUENT	55	44	43	145	42	66
	IN - OUT	370	329	365	342	547	
	% REMOVAL	87.1	88.2	89.5	70.2	92.9	85.6
	LOAD-lbs/day	192	136	126	363	133	190
C O D mg/l	INFLUENT	992	930	1040	954	1089	1001
	EFFLUENT	239	173	220	483	203	264
	IN - OUT	753	757	820	471	886	
	% REMOVAL	75.9	81.4	78.8	49.4	81.4	73.4
	LOAD -lbs/day	837	534	642	1208	643	773
T S S mg/l	INFLUENT	54	404	444	480	464	369
	EFFLUENT	128	520	90	352	204	249
	IN - OUT			354	128	260	
	% REMOVAL	0	0	80	27	56	32.6
	LOAD- lbs/day	448	1605	263	881	647	769
V S S mg/l	INFLUENT	N.R.	N.R.	432	432	412	425
	EFFLUENT	120	177	76	344	92	162
	IN - OUT			356	88	320	
	% REMOVAL			82	20	78	60.0
	LOAD –lbs/day	420	546	222	861	292	468
Settleable Solids ml/l	INFLUENT	24	15	35	19	740	27
	EFFLUENT	.2	0.6	0.3	19	0.2	4
	IN - OUT	23.8	14.4	34.7	0	38.8	
	% REMOVAL	99	96	99	0	99.5	78.7
T O C mg/l	INFLUENT	235	170	240	170	170	197
	EFFLUENT	60	40	32.5	80	45	52
	IN - OUT	175	130	207.5	90	125	
	% REMOVAL	74.5	76.5	86.5	53	74	73
	LOAD - lbs/day	210	123	95	200	143	154

INFLUENT BOD POPULATION EQUIVALENT = 8,053

EFFLUENT BOD POPULATION EQUIVALENT = 1,118

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

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Sheet____ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Riverdale.

DATE - OFF		11/30/70	12/1/70	12/2/70	12/3/70	12/4/70	AVERAGE or MEDIAN*
FLOW - MGD		0.42	0.37	0.35	0.30	0.38	0.36
KTELDAHL NITROGEN as N	CONC.-mg/l	8.0	7.3	7.0	22.4	8.4	11.0
	LOAD-lbs/day	28	23	20	56	27	31
AMMONIA NITROGEN as N	CONC.-mg/l	0.5	1.2	3.5	1.8	2.5	1.9
	LOAD-lbs/day	2	4	10	5	8	6
ORGANIC NITROGEN as N	CONC.-mg/l	7,5	6.1	3.5	20.6	5.9	9.0
	LOAD-lbs/day	26	19	10	52	19	25
NO_2 -NO_3 as N	CONC.-mg/l	13.5	15.0	10.0	20.0	19.0	16.0
	LOAD-lbs/day	47	46	29	50	60	46
TOTAL PHOSPHORUS AS P	CONC.-mg/l	15.4	15.6	15.6	19.0	16.5	16.4
	LOAD-lbs/day	54	48	46	48	52	50
CHLORIDE	CONC.-mg/l	45.0	—	42.0	44.0	40.0	43.0
	Influ	-	44.0				
TOTAL COLIFORM	CONC.-MPN/100ml	18-	18-	18-	18-	18-	18-
Fecal COLIFORM	CONC.-MPN/100ml	18-	18-	18-	18-	18-	18-

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of _____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT December 1, 1970

PLANT NAME: Riverdale Estates Waste Water Treatment Plant

PLANT OWNER: Ecological Utilities, Inc.

ADDRESS N.W. Second Avenue and 200th Street, Miami

TELEPHONE 621-7311

COLLECTION SYSTEM – TYPE: Separate

OWNER: Same as Plant

ADDRESS:

TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 0.875 MGD YEAR COMPLETED: 1970

STREAM FLOW cfs | DURATION days FREQUENCY Yrs

CONSTRUCTION COST $205,000

POPULATION SERVED 3,500 (based on 3.5 persons per connection and 1,000 actual connections)

OPERATION ANNUAL COST $15,300

PERSONNEL One full time operator plus help from water plant operator. Lab support from Andover

LEVEL OF CERTIFICATION C

CONDITION OF EQUIPMENT Fair

OUTFALL TYPE SIZE LENGTH

DISCHARGED TO: Snake Creek Canal WATER COURSE MILEAGE:

LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Comminutor with bar screen in parallel, complete mix activated sludge unit, two secondary clarifiers in parallel, chlorine contact chamber.

SLUDGE TREATMENT Aerobic digester, not in operation

DISPOSAL Trucked to Dade County dump

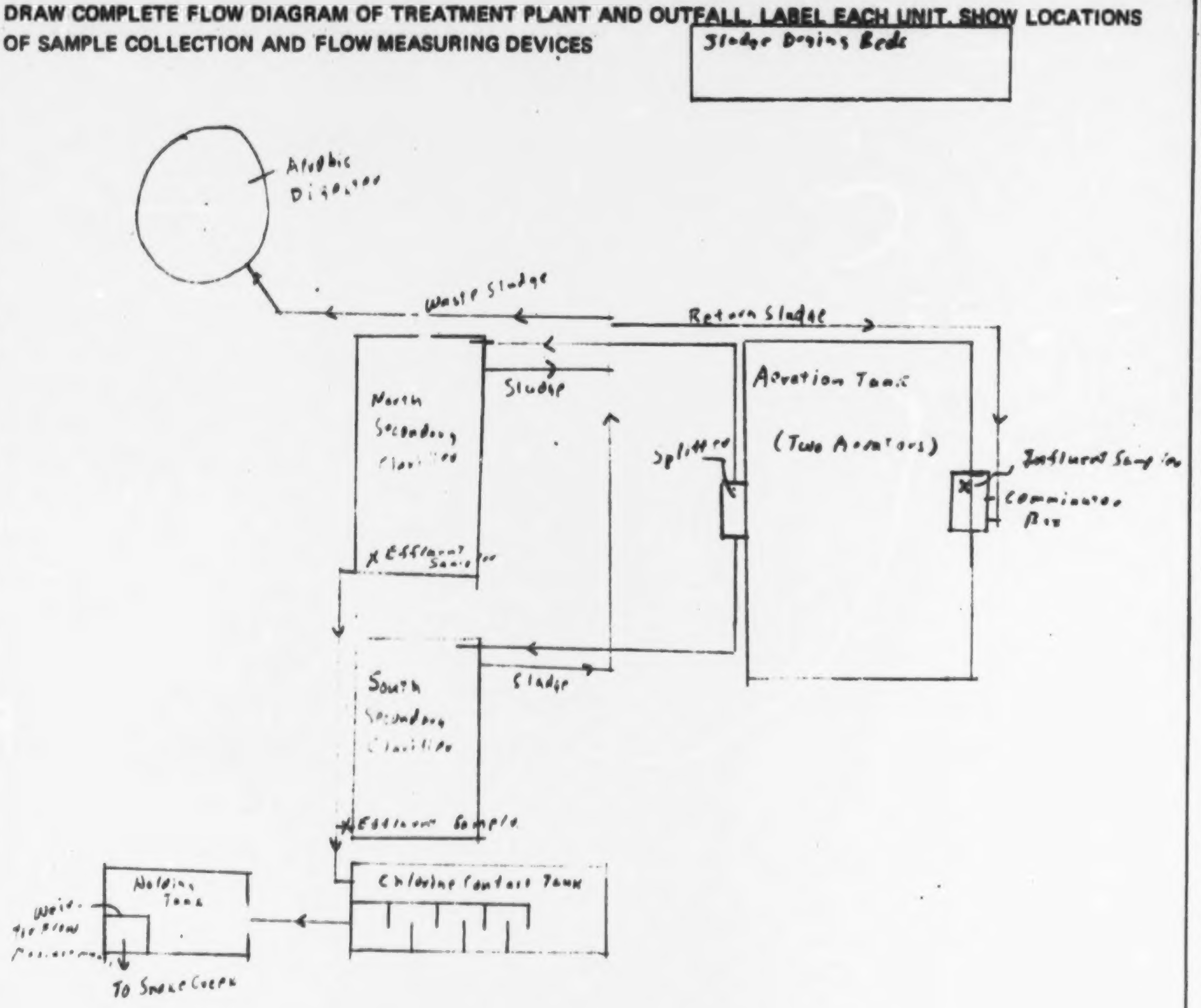
REMARKS Micro strainer to be installed early in 197[illegible]. Gross over dosing of chlorine at present.

EPARED BY: Robert L. King

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Riverdale Estates

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL, LABEL EACH UNIT, SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Sludge Drying Beds
Aerobic Digester
Waste Sludge
Return Sludge
North Secondary Clarifier
Sludge
Aeration Tank
(Two Aerators)
Splitter
Influent Sampling
Comminutor Box
X Effluent Sampler
South Secondary Clarifier
Sludge
X Effluent Sample
Chlorine Contact Tank
Holding Tank
Weir for Flow Measurement
To Snake Creek

PREPARED BY:

LOWER FLORIDA ESTUARY STUDY

Report on Waterborne Wastes From
South Dade Farm Labor Camp Wastewater Treatment Plant
Housing Authority of the City of Homestead
P. O. Box 278
Homestead, Dade County, Florida
March 23 , 1971

INTRODUCTION

The South Dade Farm Labor Camp was surveyed during the periods January 4-8, and January 26-29, 1971. The plant is a trickling filter system with a microstrainer as additional treatment. Effluent flows into the Mowrie Street Canal and subsequently into the Military Canal. Serco automatic samplers were utilized to collect 24-hour composites of influent and effluent after chlorination. Messrs. Terry Davis, Joe Hopson, and Laurence Walz were sample collectors. Primary contacts were Messrs. George Eicher, Executive Director, and Raymond P. Smith, Maintenance Supervisor and Assistant to the Director, of the Homestead Housing Authority.

SUMMARY AND CONCLUSIONS

After the sampling period of January 4-8, 1971, it was discovered that the influent sampling position was not representative of the true influent to the plant. For evaluation purposes, only the data taken on January 26-29, are utilized. The flow measured on January 27, 1971, (the only flow measured during the latter survey) was 0.126 MGD. However, this is not representative of the actual flow since the flow meter is located "upstream" from a return line from the microstrainer to the primary clarifier. Therefore, actual flow is somewhat less than this value. The average 5-day biochemical oxygen demand (BOD) of the influent and effluent for the two days of sampling were greater than 533 mg/l, respectively. The average total suspended solids (TSS) in the influent and effluent were 785 and 10 mg/l, respectively. The average chlorine residual for the three days of sampling was 3.3 mg/l and the effluent was effectively disinfected on those days when bacteriological samples were collected.

The South Dade Farm Labor Camp wastewater treatment plant removed more than 90 percent of all parameters measured. This criteria was met for BOD with an average removal of 93.9 percent, for TSS with an average removal of 98.7 percent, for chemical oxygen demand (COD) with an average removal of 92.9 percent, for volatile suspended solids (VSS) with an average removal of 99.2 percent, for total organic carbon (TOC) with an average removal of 94.6 percent, and for settleable solids with an average removal of 100 percent. These average values were calculated from the daily values.

The following recommendations are made to improve plant operation.

1. That flow meters be located so that no re-circulated flow is measured.
2. That plant design be reviewed to effe simplification of operating procedures, or that staffing requirements be re-evaluated to insure that adequately trained operating personnel are available.

INVENTORY

No specific design information was provided for this plant. The major components are:

1. Imhoff Tank which was originally designed to function as both the clarifier and the digester but is now used only as the clarifier. Sludge is drawn from the system to a small aerobic digester.
2. Trickling Filter
3. Secondary Clarifier
4. Microstrainer
5. Chlorine Contact Chamber

DISCUSSION OF RESULTS

The average flow at the South Dade Farm Labor Camp was 0.126 MGD during the latter survey and 0.120 MGD during the first survey. The design flow is 0.100 MGD. However flow measurement is inaccurate since the flow meter is located between the secondary clarifier and the microstrainer, and there is a return line from the microstrainer to the primary clarifier. There is also a return line from the secondary clarifier to a point in the influent line prior to entry into the Imhoff primary clarifier. This fact was not discovered until survey of the Redlands Farm Labor Camp. This was the reason for the second survey.

The pollutional strength of the waste was measured utilizing the BOD, COD, and TOC analyses. As stated above, the average BOD of the influent and effluent during the second survey was greater than 500 and 33 mg/l respectively. For the first survey, the average influent concentration was also 33 mg/l. The average BOD removal efficiency for the latter survey was 93.9 percent and an average of 34.8 lbs. per day of BOD was discharged. The average removal efficiencies of COD and TOC for the latter survey were 92.9 and 94.6 percent, respectively.

The influent and effluent total suspended solids concentrations for the latter survey averaged 785 and 10 mg/l, respectively, and the average removal efficiency was 98.7 percent. The plant discharged an average of 10.5 lbs. per day of suspended solids. Settleable solids removal was 100 percent for the latter survey.

Nutrients discharged by this plant were principally in the form of ammonia nitrogen, 9 lbs. per day.

The average chlorine residual for the first survey was 1.4 mg/l, and 3.3 mg/l for the second survey. The mean total and fecal coliform concentrations both were less than 18 mpn per 100 ml. The daily values for all parameters are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

The initial survey was conducted with no unusual events occurring. However, during survey of the Redlands Farm Labor Camp, an exact duplicate of this treatment plant, it was discovered that the influent sampling position was located incorrectly. It therefore became necessary to re-sample the South Dade Labor Camp, with the influent sampler correctly located. This second sampling period was accomplished on January 26-29, 1971.

General appearance, "housekeeping," and mechanical maintenance was fair. Visual appearance of the effluent was fair, although laboratory analyses indicate a high removal efficiency for all parameters. There was no apparent odor in the vicinity of the plant, even at relatively high ambient temperatures, although visual appearance of the Imhoff clarifier would suggest a possibility for a highly odorous condition.

As reported in the case of the Redlands Farm Labor Camp, the principal problems in this plant are lack of personnel and poor plant design. These problems have been discussed in detail on the report for the Redlands Farm Labor Camp and apply equally to this plant.

Prepared by Robert L. King

Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 13, 1971
PLANT NAME: South Dade Farm Labor Camp Wastewater Treatment Plant
PLANT OWNER: Housing Authority of the City of Homestead
ADDRESS Box 2781, Homestead, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above
ADDRESS:
TELEPHONE

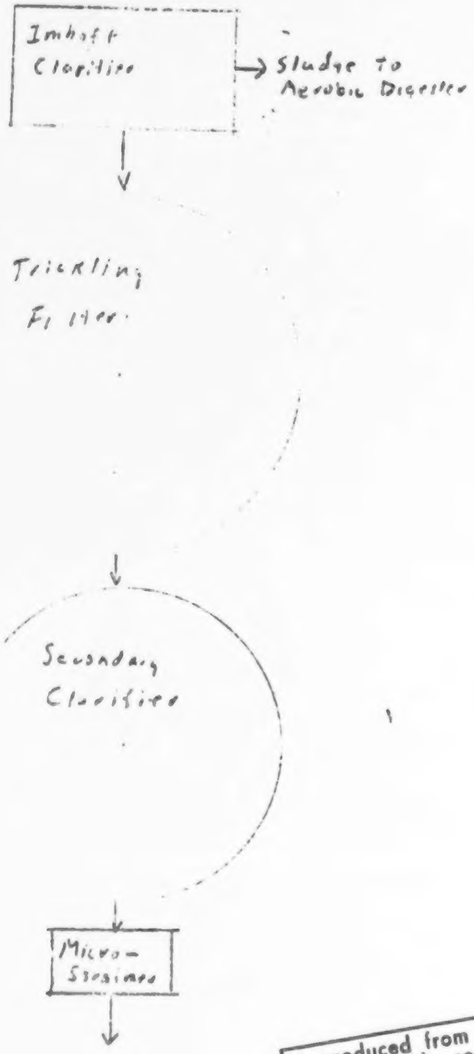
DESIGN | AVERAGE DESIGN FLOW: 0.100 MGD YEAR COMPLETED:
STREAM FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED 1350

OPERATION | ANNUAL COST
PERSONNEL One part-time operator plus one part-time laborer.
LEVEL OF CERTIFICATION None
CONDITION OF EQUIPMENT Fair
OUTFALL | TYPE SIZE LENGTH
DISCHARGED TO: Mowrie Street Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT | (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Imhoff primary clarifier, trickling filter, secondary clarifier, micro-strainer, chlorine contact chamber.

SLUDGE | TREATMENT Aerobic Digester
DISPOSAL Sludge drying beds.

REMARKS

South Dade Farm Labor Camp


Imhoff Clarifier
Sludge to Aerobic Digester
Trickling Filter
Secondary Clarifier
Micro-Strainer

Reproduced from best available copy.

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Sheet ___of_____

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT South Dade Labor Camp

							AVERAGE
DATE ON		1/26/71	1/27/71	1/28/71			
TIME ON		1100	0800	0800			☒
DATE OFF		1/27/71	1/28/71	1/29/71			☒
TIME OFF		0800	0800	0800			☒
FLOW	START X100	Not taken	95487	96740			☒
	END	Not taken	96740	98010			☒
	TOTAL		1253	flow meter	Not working correctly		☒
	24 hr. Flow Rate		125300				
INF.	TEMP. ON	23.8	23.5	22.7			23.3
	PH - ON	6.7	6.8	6.5			6.7
EFFLUENT	TEMP - ON	21.4	20.2	20.4			20.7
	PH - ON	6.1	6.4	6.8			6.5
	Cl. Residual	5.0	5.0	0			3.3
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
1/27/71	Microstrainer Effl. Very dark 1: AM & 2: AM No flow	Micro strainer down	Inf. clock stopped no sample	LRW
1/28/71	Normal	Micro strainer down	Inf. short solid plugged hose	Swaback LRW
1/29/71	Normal	Microstrainer down Cl2 tanks Empty (No Cl2)	Inf 1-7 missed because of (sw... Low Flow back)	LRW

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT South Dade Labor Camp A

DATE - OFF		1-5-71	1-6-71	1-7-71	1-8-71	1-9-71	AVERAGE
FLOW - MGD		0.110	0.130	0.120 *	0.120*		0.120
5 DAY B O D mg/l	INFLUENT	209	>765	312	285		>392.7
	EFFLUENT	27	36	34	34		32.8
	IN - OUT	182	729	278	251		
	% REMOVAL	87.1	>95.3	89.1	88.1		>89.9 >91.6
	LOAD-lbs/day	25	39	34	34		33
C O D mg/l	INFLUENT	656	3,889	1348	3725		2,404.5
	EFFLUENT	77	81	100	65		80.8
	IN - OUT	579	3808	1248	65		
	% REMOVAL	88.3	97.9	92.6	98.3		94.3 96.6
	LOAD -lbs/day	71	88	100	65		81
T S S mg/l	INFLUENT	344	1072	572	592		645
	EFFLUENT	70	124	51	44		72.3
	IN - OUT	274	948	521	548		
	% REMOVAL	79.7	88.4	91.08	92.6		88.0 88.8
	LOAD- lbs/day	64	134	51	44		73
V S S mg/l	INFLUENT	304	1036	560	564		616
	EFFLUENT	44	108	47	46		61.3
	IN - OUT	260	928	513	518		
	% REMOVAL	85.5	89.6	91.6	91.8		89.6 90.1
	LOAD --lbs/day	40	117	47	46		63
Settlable Solids ml/l	INFLUENT	5	740.0	25	14		>21
	EFFLUENT	0.1	.1	0.0	.2		0.1
	IN - OUT	4.9	39.9	2.5	13.8		
	% REMOVAL	98	>99.8	100	98.6	>	97.1 >95.7
T O C mg/l	INFLUENT	102	660	235	158		288.7
	EFFLUENT	27	30	40	20		29.3
	IN - OUT	75.5	630	195	138		
	% REMOVAL	73.7	95.5	83.0	87.3		84.9 89.9
	LOAD - lbs/day	25	33	40	20		30

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* Average Flow Used

Released

From The Desk Of
Michael V. Polito

Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT South Dade Labor Camp

DATE - OFF		1-5-71	1-6-71	1-7-71	1-8-71	1-9-71	AVERAGE or MEDIAN*
FLOW - MGD		0.110	0.130	0.120*	0.120*		0.120
KTELDAHL NITROGEN as N	CONC.-mg/l	7.7	7.4	10.8	8.8		8.7
	LOAD-lbs/day	7	8	11	9		9
AMMONIA NITROGEN as N	CONC.-mg/l	4.0	5.3	8.2	5.5		5.8
	LOAD-lbs/day	4	6	8	6		6
ORGANIC NITROGEN as N	CONC.-mg/l	3.7	2.1	2.6	3.3		2.9
	LOAD-lbs/day	3	2	3	3		3
NO_2 - NO_3 as N	CONC.-mg/l	5.7	4.7	4.3	4.7		4.9
	LOAD-lbs/day	5	5	4	5		5
TOTAL PHOSPHORUS AS P	CONC.-mg/l	6.0	6.1	5.8	6.2		6.0
	LOAD-lbs/day	6	7	6	6		6
CHLORIDE	CONC.-mg/l	48	46	50	47		48
TOTAL COLIFORM	CONC.-MPN/100ml	330	—	<18	<18		<18
Fecal COLIFORM	CONC.-MPN/100ml	<18	—	<18	<18		<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT - DATA SUMMARY

PLANT South Dade Labor Camp B

DATE - OFF		1/27/71	1/28/71	1/29			AVERAGE
FLOW - MGD							
5 DAY BOD mg/l	INFLUENT	N/S	>798	201			>500
	EFFLUENT	54	26	18			33
	IN - OUT						
	% REMOVAL	N/A	>96.7	91.0			93.9
	LOAD-lbs/day						
COD mg/l	INFLUENT	NO INF.	2561	3626			3069
	EFFLUENT	283	119	279			227
	IN - OUT						
	% REMOVAL	N/A	93.4	92.3			92.9
	LOAD -lbs/day						
TSS mg/l	INFLUENT	N/S	1080	490			785
	EFFLUENT	324 ⊛	11	8			10
	IN - OUT						
	% REMOVAL	N/A	99.0	98.4			98.7
	LOAD- lbs/day						
VSS mg/l	INFLUENT	N/S	980	482			731
	EFFLUENT	248 ⊛	7	5			6
	IN - OUT						
	% REMOVAL	N/A	99.3	99.0			99.2
	LOAD -lbs/day						
Settlable Solids ml/l	INFLUENT	N/S	insuf. sample	2.0			2
	EFFLUENT	8 ⊛	0	0.0			0
	IN - OUT						
	% REMOVAL	N/A	N/A	100			100
TOC mg/l	INFLUENT	N/S	530	140			335
	EFFLUENT	85 ⊛	19	16			18
	IN - OUT						
	% REMOVAL	N/A	96.4	88.6			94.6
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

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From The Desk Of
Michael V. Polito
MP

⊛ omitted from calculation of averages.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT South Dade Labor Camp

DATE - OFF		1/27	1/28	1/29			AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	19.4	10.0	10.6			13.3
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	10.0	7.4	8.0			8.5
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l	9.4	2.6	2.6			4.9
	LOAD-lbs/day						
NO_2 -NO_3 as N	CONC.-mg/l	2.8	2.2	1.8			2.3
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	10.2	6.1	6.0			7.4
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	49	46	46			47
TOTAL COLIFORM	CONC.- MPN/100ml	20	<18	490,000			20
Fecal COLIFORM	CONC.- MPN/100ml	<18	<18	220,000			<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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Sheet ___ of ___

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT South Dade Labor Camp STP

							AVERAGE
DATE ON		4 Jan 71	5 JAN 71	6 Jan, 71	7 Jan, 71		
TIME ON		0800	0840	0855	0831		
DATE OFF		5 JAN 71	6 Jan, 71	7 Jan, 71	8 Jan, 71		
TIME OFF		0840	0855	0831	0815		
FLOW	START	8347000	8460000	859,1500	859 2000		
	END	0084600	859 1501	859 2,000	859 2000		
	TOTAL	113,000	131,500	? Counter	quick		
	24 hr. Flow Rate	109,[illegible]	130,413	working	properly		120,105
INF.	TEMP. ON	25	25	24.5	25		24.9
	PH - ON	7.7	7.5	7.2	7.0		7.4
EFFLUENT	TEMP - ON	24	25	25	24.5		24.6
	PH - ON	7.0	7.2	6.8	6.8		7.0
	Cl. Residual	>1.0	1.5	1.5	1.5		1.4
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
4 Jan, 71	Normal	No algae growth in trickle filter, Clarifier has odor.		
5 Jan 71	Normal	INF #8 BLANK, #6 short INF #24 TRIGGERED while installing ~~[illegible]~~ ~~[illegible],7,8,~~		JHW
6 Jan	Normal	Trickle filter arms not rotating. secondary clarifier over the weir	over	
7 Jan	Normal	over secondary clarifier over the weir	13-17 Inf. OK	
8 Jan	Normal	flock coming out of secondary clarifier	Inf-6 blank 2-80 ml	

Lower Florida Estuary Study
Report on Waterborne Wastes from
South Miami Heights Public Utilities Waste Water Treatment Plant
S.W. 117th Avenue and U.S. 1
Mailing Address P.O. Box 250
Perrine, Dade County, Florida
February 16, 1971

INTRODUCTION

The South Miami Heights Waste Water Treatment Plant was surveyed during the period January 3 - 8, 1971. The plant is an activated sludge system with final effluent flowing into a feeder canal to Black Creek. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent before chlorination. Daily grab samples for pH, temperature, chlorine residual, and total and fecal coliform were also collected. Messrs. Terry Davis and Joe Hopson were sample collectors. Primary contact was Gary Mishoe of the South Miami Heights Public Utilities Corporation.

SUMMARY AND CONCLUSIONS

The average influent five-day biochemical oxygen demand (BOD_5) concentration was >507 mg/l and the average effluent concentration was 34.3 mg/l. The average influent and effluent concentrations of total suspended solids (TSS) were 958 and 83 mg/l respectively. The median total coliform concentration for this plant was 410 MPN per 100 ml and the median fecal coliform concentration was 32 MPN per 100 ml. The average chlorine residual concentration in the effluent was 1.1 mg/l.

The proposed State of Florida performance criteria requires 90% treatment. The BOD_5 requirement was met with an average removal efficiency of 91.2%. The TSS requirement was not met, since the average removal efficiency was 85.1%. However, a highly concentrated slug of waste received by the plant just prior to the study period appears to account for the poor solids removal. On the last three days of the study, when operation stabilized, the average TSS removal efficiency for the period was 94.7%. The average removal efficiencies and loads were calculated from the daily values.

The following are recommended to improve plant operation:

1. A flow measuring device should be installed.

2. The outfall should be modified to eliminate the aesthetic problem of detergent foam in the feeder canal.

INVENTORY

Major components are:

1. Comminutor.
2. Four primary clarifiers, with three presently in use.
3. Four aeration tanks.
4. Four secondary clarifiers.
5. Chlorine contact chambers.
6. Two-stage aerobic digestion.

DISCUSSION OF RESULTS

The actual flow measured at the South Miami Heights Waste Water Treatment Plant during the study was 1.089 MGD and the design flow is 1.75 MGD. There is no flow meter at this plant and flow was measured at the chlorine contact chamber effluent weir by a plant operator. During the study, flow was measured at two-hour intervals during the following periods: January 4, 1971, 1200 to 1900; January 5, 1971, 0800 to 1800; and January 6, 1971, 0800 to 1400.

The average influent and effluent BOD_5 concentrations during the study were >507 and 34.3 mg/l respectively. The average BOD_5 removal efficiency was 91.2%, and 306 lbs. per day were discharged. The plant was designed for an effluent loading of 200 ppm or 2,920 lbs. per day and is receiving a waste load of >4,600 lbs. per day or >507 mg/l. Even considering this, no deterioration in the performance of the plant with respect to BOD_5 removal has been observed. The chemical oxygen demand (COD) and total organic carbon (TOC) tests were also used to determine the efficiency of the plant. The average removal efficiencies for COD and TOC were 95.0 and 84.3% respectively.

The average influent and effluent TSS concentrations during the study were 958 and 83 mg/l respectively. The removal efficiencies were 58.4 and 83.0% on January 4, 1971 and January 5, 1971, respectively. However, they exceeded 90% for the next three days. The low removal efficiency during the initial part of the study was due to a slug of waste entering the plant on January 1, 1971. The average volatile suspended solids loading was 668 lbs. per day and that for fixed solids was 83 lbs. per day. The average settleable solids removal efficiency was 99.5%.

Most of the nitrogenous material discharged by this plant was in the form of ammonia nitrogen, with an average of 164 lbs. per day discharged at a concentration of 18 mg/l. The average loads of organic and nitrite-nitrate nitrogen discharged were 38 and 10 lbs. per day respectively. The plant also discharged 123 lbs. per day of total phosphorus at 13.6 mg/l.

The average chlorine residual concentration in the effluent was 1.1 mg/l during the study. Even though the waste appeared to be properly disinfected, relatively high concentrations of both total and fecal coliform were found. The maximum total coliform concentration was 1,400 MPN per 100 ml and the median was 410 MPN per 100 ml. The maximum and median fecal coliform concentrations were 220 and 32 MPN per 100 ml.

DISCUSSION

General appearance of the plant is good. "Housekeeping" and mechanical maintenance were good during the period. At present, a new aerobic digester is under construction. As an interim measure, sludge is being hauled to Virginia Key by spetic tank trucks. On or about January 1, 1971, a line clearing program was in progress and a blockage was discovered and corrected. This caused a shock loading on the plant. It was necessary to waste a great amount of sludge, causing some loss in biological activity, plus an apparent "carry-over" of suspended solids on January 4, 1971. Mr. Mishoe was quite free and open in discussing this problem, and accurately predicted the results that would be obtained from the laboratory analyses.

The operators of this plant are extremely competent. All of the present personnel have been employed at the plant for less than six months. Therefore, the plant is in a state of transition, but definite signs of progress can be observed in the plant since our first visit late November 1970. There is a complete laboratory on site, and the results of past analyses by this laboratory correlated quite closely with our analyses. This has not generally been true in other plants.

During the early part of the week, there was a problem of detergent foam in the feeder canal near the outfall. As the plant recovered normal operation, this situation decreased in severity. The outfall is not a submerged type, so that the free fall of the effluent increases the foam problem.

LAWRENCE W. OLINGER

ROBERT L. KING

Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 7, 1971
PLANT NAME: South Miami Heights Public Utilities Corp.
PLANT OWNER: South Miami Heights Public Utilities Corp.
ADDRESS P.O. Box 250, Perrine, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 1.75 MGD YEAR COMPLETED: 1957
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED 12,824 plus shopping center, 3 schools, restaurant and lounge, swimming pool, two churches, and one service station.

OPERATION ANNUAL COST No data.
PERSONNEL 3 operators, one laborer, one mechanic.
LEVEL OF CERTIFICATION "A" for one operator.
CONDITION OF EQUIPMENT Good and improving.
OUTFALL TYPE Above water level. SIZE LENGTH
DISCHARGED TO: Feeder canal to Black Creek. WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Bar minutor, primary clarification, aeration units, secondary clarifiers, chlorine contact chamber.

SLUDGE TREATMENT Presently hauling to Virginia Key, two stage aerobic digester under consideration.
DISPOSAL Will be to sludge drying beds.

REMARKS

ARED BY: Robert L. King

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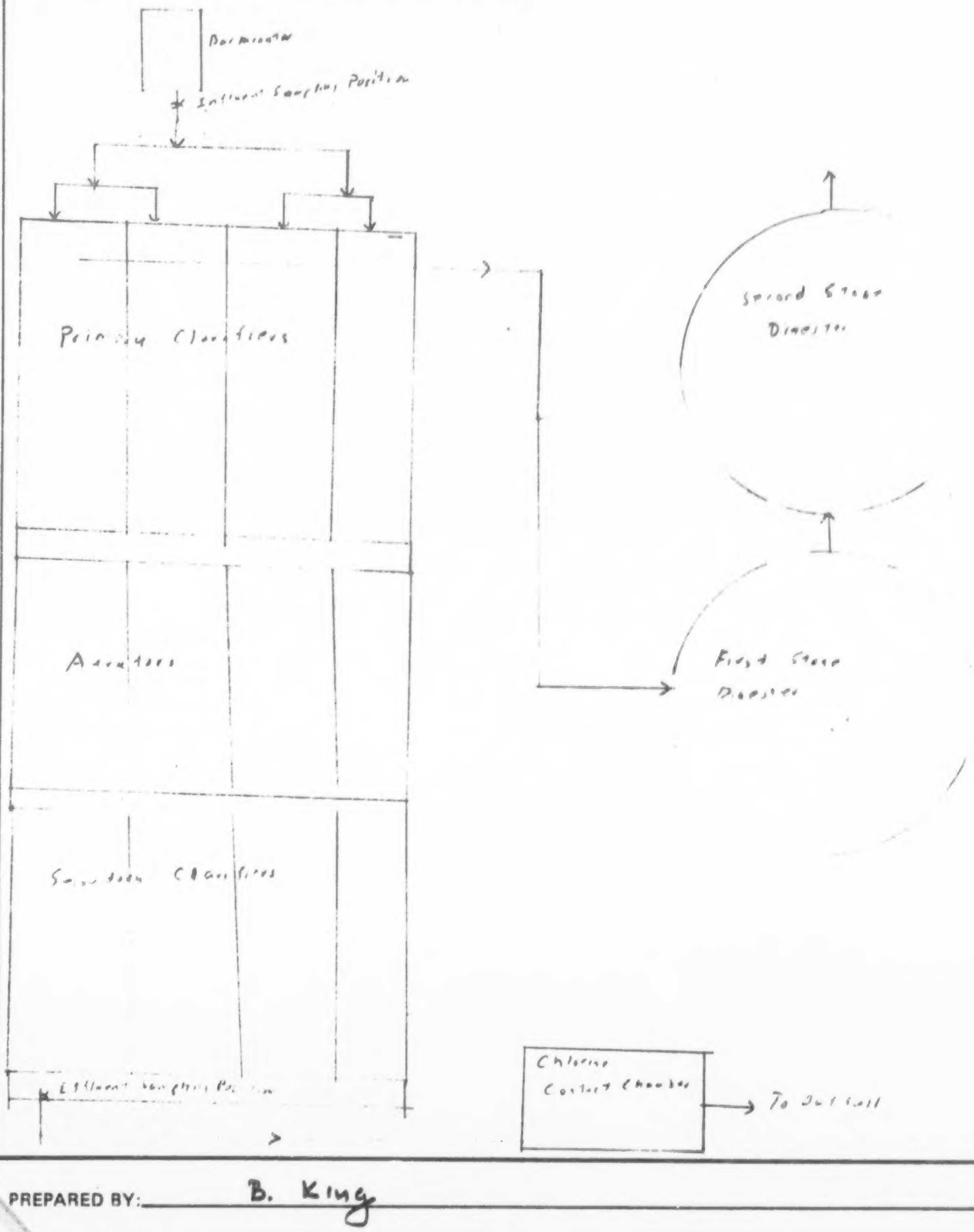
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM
PLANT South Miami Heights Public Utilities

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Barminutor
* Influent Sampling Position
Primary Clarifiers
Aerators
Secondary Clarifiers
* Effluent Sampling Position
Second Stage Digester
First Stage Digester
Chlorine Contact Chamber
To Outfall

PREPARED BY: B. King

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT South Miami Heights

DATE · OFF		1-4-71	1-5-71	1-6-71	1-7-71	1-8-71	AVERAGE
FLOW · MGD		1.089*	1.310	0.787	1.170	1.089*	1.089
5 DAY B O D mg/l	INFLUENT	337	376	522	561	2745	2507
	EFFLUENT	47	42	47	23	12.5	34.3
	IN · OUT	286	334	475	538		
	% REMOVAL	85.9	88.8	91.0	95.9	98.3	91.2
	LOAD-lbs/day	427	459	308	224	114	306
C O D mg/l	INFLUENT	2011	1506	1,694	2503	2541	2051
	EFFLUENT	97	114	116	85	61	94.6
	IN · OUT	1914	1392	1578	2418	2480	
	% REMOVAL	95.2	92.4	93.2	96.6	97.6	95.0
	LOAD -lbs/day	881	1245	761	829	554	854
T S S mg/l	INFLUENT	332	636	900	732	2192	958
	EFFLUENT	138	108	88	26	54	83
	IN · OUT	194	528	812	706	2138	
	% REMOVAL	58.4	83.0	90.2	96.4	97.5	85.1
	LOAD- lbs/day	1253	1180	578	254	490	751
V S S mg/l	INFLUENT	256	604	860	720	2176	923
	EFFLUENT	128	76	82	27	60	75
	IN · OUT	137	528	778	693	2116	
	% REMOVAL	50.0	87.4	90.5	96.3	97.2	84.3
	LOAD –lbs/day	1165	830	538	263	544	668
Settlable Solids ml/l	INFLUENT	8	15	19	15	36	19.0
	EFFLUENT	.1	.1	0.0	.1	0.0	0.1
	IN · OUT	7.9	14.9	19.	14.9	36.0	
	% REMOVAL	98.8	99.3	100	99.3	100	99.5
T O C mg/l	INFLUENT	103	180	280	340	415	264
	EFFLUENT	34	27	53	25	18	31
	IN · OUT	69	153	227.5	315	397	
	% REMOVAL	67.0	85	81.1	92.6	95.7	84.3
	LOAD · lbs/day	309	295	348	244	163	272

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* AVERAGE FLOW USED

Released

From The Desk Of
Michael V. Polito MP

Sheet 4 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT South Miami Heights

DATE - OFF		1/4/71	1-5-71	1-6-71	1-7-71	1-8-71	AVERAGE or MEDIAN*
FLOW - MGD		1.089*	1.310	0.787	1.170	1.089*	1.089
KTELDAHL NITROGEN as N	CONC.-mg/l	25.9	25.4	23.9	20.7	15.1	22.2
	LOAD-lbs/day	235	278	157	202	137	202
AMMONIA NITROGEN as N	CONC.-mg/l	20.4	19.0	18.0	18.0	14.5	18.0
	LOAD-lbs/day	185	208	118	176	132	164
ORGANIC NITROGEN as N	CONC.-mg/l	5.5	6.4	5.9	2.7	0.6	4.2
	LOAD-lbs/day	50	70	39	26	5	38
NO_2 -NO_3 as N	CONC.-mg/l	0.2	0.1	0.07	0.4	4.5	1.1
	LOAD-lbs/day	2	1	0	4	41	10
TOTAL PHOSPHORUS AS P	CONC.-mg/l	15.0	13.0	13.0	11.9	15.0	13.6
	LOAD-lbs/day	136	142	85	116	136	123
CHLORIDE	CONC.-mg/l	41	41	42	41	39	41
TOTAL COLIFORM	CONC. - MPN/100ml	490	20	—	1400	330	410
Fecal COLIFORM	CONC. - MPN/100ml	45	<18	—	220	<18	32

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

Sheet 5 of 5

PLANT S. Miami Heights

DATE ON		3 Jan, 71	4 Jan	5 JAN 71	6 Jan 71	7 Jan, 71	AVERAGE
TIME ON		0900	1100	1105	1055	1005	
DATE OFF		4 Jan, 71	5 JAN 71	6 Jan	7 Jan, 71	8 Jan, 71	
TIME OFF		1100	1105	1055	1005	1010	
FLOW	START	over					
	END						
	TOTAL						
	24 hr. Flow Rate		1.31 mgd	.787 mgd	1.17 mgd		1.089 mgd
INF.	TEMP. ON	26	26.5	25.5°	27	26.5	26.3
	PH - ON	7.3	7	7.2	7.4	7.2	7.2
EFFLUENT	TEMP - ON	27	26.5	26	26	27	26.5
	PH - ON	7.1	7.2	6.9	7.0	6.7	7.0
	Cl. Residual	>1.0	>1.0		1.0	1.5	1.1
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
3 Jan, 71	detergent foam in eff	normal	–	
4 Jan, 71	light detergent foam in effluent	"	–	
5 JAN 71	det. foam in eff	Normal	INF - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 16, 17, 18, 24 BLANK → over	
7 Jan, 71	light fleck coming out eff clarifiers	Normal	Eff - 11, 13, 14, 15, 16 blank - over	
~~9 Jan~~ 8 Jan 7	Same as above	"	over	

Lower Florida Estuary Study
Report on Waterborne Wastes from
Southern Estates Waste Water Treatment Plant
11955 S.W. 34th Street
Owned by Southland Utilities Corporation
15450 N.W. 27th Avenue
Opa Locka, Dade County, Florida
February 16, 1971

INTRODUCTION

The Southern Estates Waste Water Treatment Plant was surveyed during the period December 13 - 18, 1970. The plant is basically a contact stabilization plant, with 30% of the flow through a trickling filter after contact stabilization. Final effluent flows into a feeder canal to Snapper Creek. The Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent, after chlorination. Daily grab samples were taken after chlorination, for chlorine residual, pH, and total and fecal coliform. Messrs. Terry Davis and George Egermier were sample collectors. Primary contact was Mr. Porter Howard of Southland Utilities Corporation.

SUMMARY AND CONCLUSIONS

An average flow through the Southern Estates Waste Water Treatment Plant of 1.43 MGD was measured during the study period. The average five-day biochemical oxygen demand (BOD_5) of the influent and effluent were 134 and 31 mg/l respectively. An average BOD_5 of 373 lbs. per day was discharged to a feeder canal which flows into Snapper Creek. The average influent total suspended solids concentration was 166 mg/l, and an average loading of 588 lbs. per day was discharged at an average concentration of 50 mg/l. The median concentration of total coliform was 615 MPN/100 ml, while the median fecal coliform concentration was 560 MPN/100 ml, an indication of inadequate disinfection.

This plant does not meet the proposed State of Florida performance criteria, which requires 90% treatment. The average BOD_5 removal efficiency was 76.1% during the study and that for total suspended solids was 70%. The average removal efficiencies and loads were calculated from their respective daily values.

The following are recommended to improve plant operation:

1. The expeditious elimination of the infiltration problem in the collection system.

2. The reevaluation of chlorination procedures to ensure effective disinfection.

3. Modification of operation or installation of additional devices to increase BOD_5 and total suspended solids removal efficiency.

INVENTORY

Specific design criteria were not available for this plant.

Major components are:

1. Comminutor.
2. Contact stabilization tank, with mechanical aeration.

3. Circular clarifier, which receives 70% of the flow from the contact chamber. Effluent from this clarifier flows directly to the chlorine contact chamber.

4. Rectangular clarifier, which receives 30% of the flow from the contact stabilization tank. Flow from this clarifier is to a high rate trickling filter, then to a rectangular clarifier, and then to the chlorine contact chamber.

5. Aerobic digester, which periodically receives sludge from the circular secondary clarifier.

DISCUSSION OF RESULTS

The average flow during the study period was 1.43 MGD, which is considerably greater than the design flow of 1.05 MGD. The average total chlorine residual was 2.8 mg/1, but disinfection of the influent was not effective. The median concentration of total coliform was 615 MPN/100 ml, and the median concentration of fecal coliform was 560 MPN/100 ml. The pollutional strength of the discharge and efficiency of the plant were determined by the five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD) and the total organic carbon (TOC) tests. The average BOD_5 of the effluent was 31 mg/1 and an average of 373 lbs. per day were discharged to the feeder canal which flows into Snapper Creek. The removal efficiencies of BOD_5 varied from 61.5 to 85% for an average of 76.1%. The influent BOD_5 varied from 120 to 167 mg/1 and averaged 134 mg/1. This was a low value for influent BOD_5 concentration relative to other values measured during the Dade County survey. This low concentration substantiates the belief that there is a high rate of infiltration in the collection system, although the average chloride concentration of 45 mg/l does not indicate brackish water infiltration. The average removals of COD and TOC were 78.0 and 67.6% respectively.

The average removal of total suspended solids (TSS) was 70%, and daily values ranged from 47.6% to 85.3%. The average quantity of TSS in the effluent was 50 mg/l or 588 lbs. per day. This low removal efficiency of TSS was substantiated by the visual appearance of the effluent during the survey. The plant efficiently removed settleable solids since the average removal was 98.0%.

During the survey the plant discharged an average of 104 lbs. total phosphorus per day and 135 lbs. of ammonia nitrogen per day.

Daily values of the data collected during the study are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF OBSERVATIONS

General appearance of the plant is good, with "housekeeping" and mechanical maintenance adequate. Visual appearance of the effluent was poor, as is reflected in the low suspended solids removal efficiency. The outstanding problem in plant operation is that of hydraulic overloading, caused by infiltration in the collection system. During the three days of the survey when the flow meter was in operation, the average flow was 1.43 MGD, which is 136% of the design flow of 1.05 MGD. Flow records for the period December 15, 1970 to January 7, 1971, indicate an average flow of 1.390 MGD, with a range of 1.230 to 1.650 MGD. The low BOD_5 value for the influent reflects the fact that most of the overload is infiltration. Plant management is aware of this and is making some effort to solve the problem. I recommend that this effort be accelerated. Local pollution control authorities should resurvey plant operation after the infiltration problem is solved.

ROBERT L. KING

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Sheet 1 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT January 7, 1971
PLANT NAME: Southern Estates
PLANT OWNER: Southland Utilities Corporation
ADDRESS 15450 N.W. 27th Ave., Opa Locka, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate.
OWNER: Same as above.
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 1.05 MGD YEAR COMPLETED: 1967
STREAM FLOW cfs DURATION days FREQUENCY Yrs
CONSTRUCTION COST No data.
POPULATION SERVED 2,500

OPERATION ANNUAL COST
PERSONNEL Superintendent, operator-lab technician, 2 operators, lift station-mechanic, 2 laborers.
LEVEL OF CERTIFICATION Superintendent has "A".
CONDITION OF EQUIPMENT Fair

OUTFALL TYPE Submerged SIZE LENGTH
DISCHARGED TO: Feeder canal to Snapper Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE

TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)

Comminutor, contact aeration tank. 70% of flow to secondary clarifier, then to chlorine contact chamber. 30% to clarifier, trickling filter, then to secondary clarifier and to chlorine contact chamber.

SLUDGE TREATMENT Aerobic digester, then to sludge bed.

DISPOSAL To land fill.

REMARKS 40% hydraulic overloaded.

PARED BY: Robert L. King

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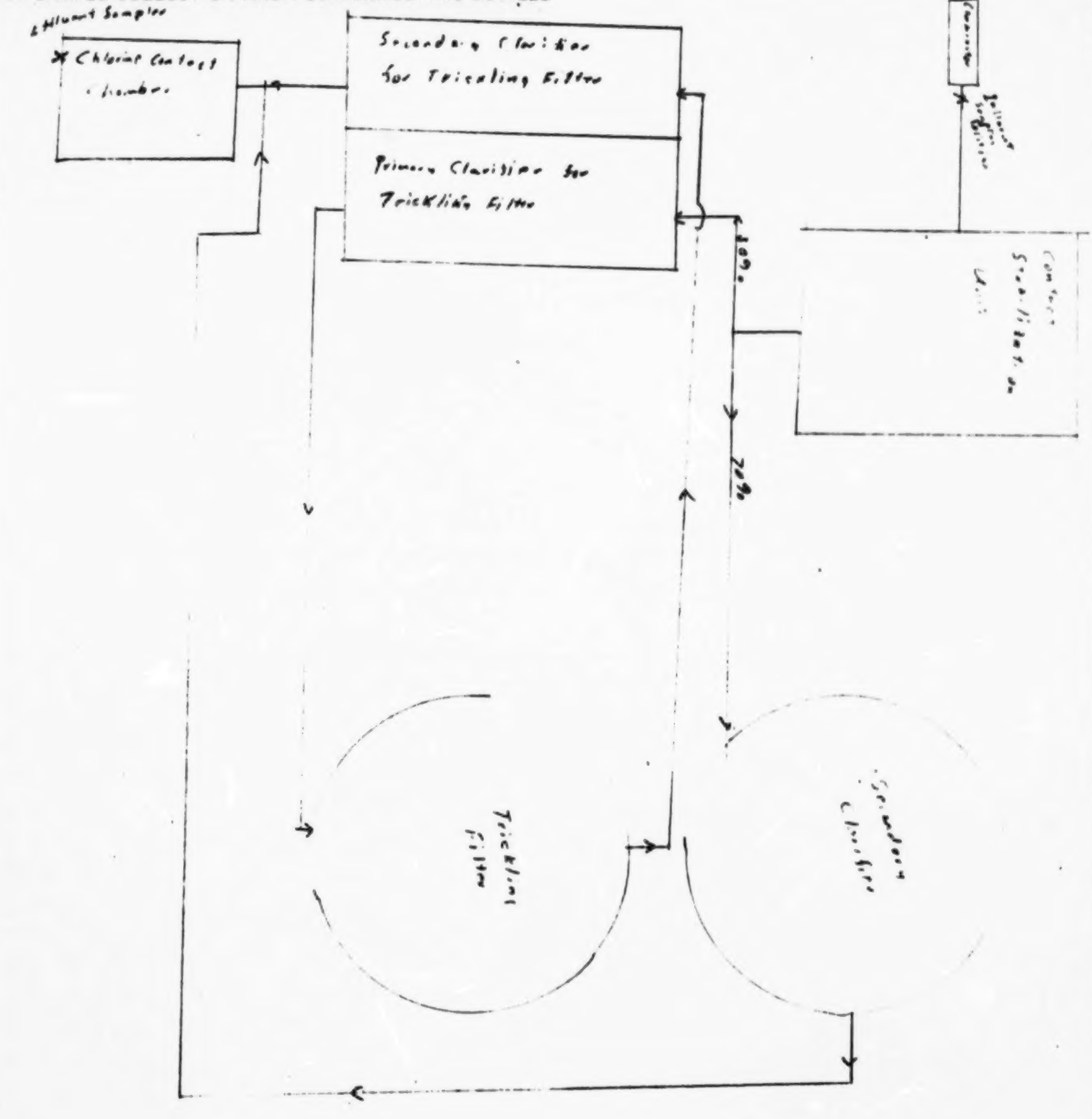
LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – SCHEMATIC DIAGRAM

PLANT Southern Estates S.T.P.

DRAW COMPLETE FLOW DIAGRAM OF TREATMENT PLANT AND OUTFALL. LABEL EACH UNIT. SHOW LOCATIONS OF SAMPLE COLLECTION AND FLOW MEASURING DEVICES


Effluent Sampler
* Chlorine Contact Chamber
Secondary Clarifier for Trickling Filter
Primary Clarifier for Trickling Filter
Comminutor
Influent Sampler
Contact Stabilization Unit
30%
70%
Trickling Filter
Secondary Clarifier

PREPARED BY:

Sheet 3 of 5

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Southern Estates S.T.P.

DATE - OFF		12/14/70	12/15	12/16	12/17	12/18	AVERAGE
FLOW - MGD		1.428*	1.428*	1.438	1.277	1.369	1.428
5 DAY B O D mg/l	INFLUENT	120	130	130	167	124	134.2
	EFFLUENT	33	50	23.7	25	25	31.
	IN - OUT						
	% REMOVAL	72.5	61.5	81.8	85.0	79.8	76.1
	LOAD-lbs/day	393	595	284	266	327	373
C O D mg/l	INFLUENT	566	592	263	591	495	501
	EFFLUENT	89	184	84	100	72	106
	IN - OUT						
	% REMOVAL	84.3	68.9	68.0	83.1	85.5	78.0
	LOAD -lbs/day	1060	2191	1007	1065	942	1253
T S S mg/l	INFLUENT	140	168	164	176	184	166
	EFFLUENT	44	88	42	48	27	50
	IN - OUT						
	% REMOVAL	68.6	47.6	74.4	72.7	85.3	70
	LOAD- lbs/day	524	1048	504	511	353	588
V S S mg/l	INFLUENT	120	140	132	160	136	138
	EFFLUENT	40	48	39	45	28	40.
	IN - OUT						
	% REMOVAL	66.7	65.7	70.5	71.9	79.4	71
	LOAD –lbs/day	476	572	468	479	366	472
Settlable Solids ml/l	INFLUENT	8	4	5	5	4	5
	EFFLUENT	0.0	.4	0.0	0.0	0.0	<.1
	IN - OUT						
	% REMOVAL	100	90.0	100	100	100	98.0
T O C mg/l	INFLUENT	105	87.5	95	100	90	96
	EFFLUENT	27	47.5	34	26	18	30
	IN - OUT						
	% REMOVAL	74.3	45.7	64.2	74.0	80.0	67.6
	LOAD - lbs/day	321	566	403	277	236	362

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

* Average flow during the study period.

Released.

From The Desk Of
Michael V. Polito

Sheet 4 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Southern Estates S.T.P.

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DATE - OFF		12/14	12/15	12/16	12/17	12/18	AVERAGE or MEDIAN*
FLOW - MGD		1.428*	1.428*	1.438	1.277	1.569	1.428
KTELDAHL NITROGEN as N	CONC.-mg/l	13.4	19.0	12.6	11.2	11.5	13.5
	LOAD-lbs/day	160	226	151	119	150	161
AMMONIA NITROGEN as N	CONC.-mg/l	11.7	12.0	12.2	10.6	10.4	11.4
	LOAD-lbs/day	139	143	146	113	136	135
ORGANIC NITROGEN as N	CONC.-mg/l	1.7	7.0	0.4	0.6	1.1	2.2
	LOAD-lbs/day	20	83	5	6	14	26
NO_2 - NO_3 as N	CONC.-mg/l	0.6	1.1	0.6	0.8	1.2	0.9
	LOAD-lbs/day	7	13	7	9	16	10
TOTAL PHOSPHORUS AS P	CONC.-mg/l	6.7	14.2	7.2	7.3	8.0	8.7
	LOAD-lbs/day	80	169	86	78	105	104
CHLORIDE	CONC.-mg/l	47	47	46	39	45	45
TOTAL COLIFORM	CONC.-MPN/100ml	1100	<18-	49,000	–	130	615
		1400		~~2400~~			
Fecal COLIFORM	CONC.-MPN/100ml	1100	<18-	2400	–	<18	560

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

* Average flow during the study period.

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Sheet 5 of 5

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Southern Estates S.T.P.

DATE ON		13 Dec 70	14 Dec 70	15 Dec 70	16 Dec 70	17 Dec	AVERAGE	
TIME ON		0500	0530	0520	0946	1143		
DATE OFF		14 Dec 70	15 Dec 70	16 Dec 70	17 Dec 70	18 Dec 70		
TIME OFF		0930	0420	0946	1143	0955		
FLOW	START X 100	-	—	13800070	13814687.	13828520		
	END	-	13800070	13814687	13828520	13843037		
	TOTAL	-	-	1,461,700	1,383,300	1,451,700		
	24 hr. Flow Rate	-	-	1,437,738	1,276,892	1,569,405	1,428,012	
INF.	TEMP. ON	25.4°C	25.1°C	25.4°C	25.0°C	[illegible]°C	25.8°C	avg 25.2
	PH - ON	10.3	9.7	7.4	7.3	[illegible]	7.3	8.4
EFFLUENT	TEMP - ON	23.1°C	22.8°C	24.5°C	24.5	[illegible]°C	22.2°C	23.5
	PH - ON	9.9	9.4	7.4	7.3	[illegible]	6.7	8.1
	Cl. Residual	2.0 est	5.0	2.5	2.5	[illegible]	2.0 est	2.8
	CHLORINE-ON	locked	no key	—	230 #			
	CHLORINE-OFF	-	-	230 #		430 #		
	ON-OFF-lbs	-	-	—				

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
13 Dec 70	Clear with small to medium size chunks of solids	Normal	O.K.	—
14 Dec 70	Normal	(Normal)? Reported to by-pass part of plant to post Cl2 channel	8 off, empty	GAE
15 Dec 70	Normal small suspended solids white (grease) specks	Normal	O.K.	GAE
16 Dec 70	Turbid small large solids in eff.	Flow meter at 2.0 Hockey puck at 10.5" Normal	Inf 3,4,5 blank 2 low flow	GAE
17 Dec 70	Normal	Normal!	Inf - 2?,1,2,3,4, ~~[illegible]~~ -low	LAW
18 Dec 70	Solids, brown	Normal	O.K.	GAE

15 ~~[illegible]~~ 24 hrs.

Lower Florida Estuary Study
Report on Waterborne Wastes from
Seaboard Airlines Industrial Park Waste Water Treatment Plant

P. O. Box 316
Miami, Dade County, Florida
March 18, 1971

INTRODUCTION

The Seaboard Airlines Industrial Park Waste Water Treatment Plant was surveyed during the period January 24 - 29, 1971. The plant is an activated sludge system with effluent flowing to the Little River Canal. Serco automatic samplers were utilized to collect five 24-hour composites of influent and effluent, after chlorination. Messrs. Lawrence Walz, Terry Davis, and Joe Hopson were the sample collectors. Primary contact was Mr. David Backmeyer, General Superintendent, Virginia Key Waste Water Treatment Plant, City of Miami, who also supervises operation of this plant.

SUMMARY AND CONCLUSIONS

The average flow during the study was 0.12 MGD. The plant is not hydraulically overloaded as it receives only 70.6% of design flow. The average biochemical oxygen demand (BOD) of the influent was greater than 788 mg/l while the average BOD of the effluent was 32 mg/l. The average total suspended solids (TSS) concentrations encountered during the study were 866 mg/l in the influent and 27 mg/l in the effluent. The chlorine residual in the effluent averaged greater than 3.5 mg/l.

A BOD removal of more than 90% was obtained in the plant. The average BOD, calculated from daily values, was greater than 95%. The total suspended solids removal was also greater than 90%, as an average value of 95.2% was obtained.

To prevent shock loadings in the plant it is recommended that surge tanks be installed.

INVENTORY

The plant is designed for an average flow of 0.17 MGD. Major components are:

1. Two mechanically aerated activated sludge units, in series.
2. Two secondary clarifiers in parallel.
3. Chlorine contact chamber.
4. Aerobic digestor and sludge drying beds.

DISCUSSION OF RESULTS

The average flow at the Seaboard Airlines Industrial Park Waste Water Treatment Plant was 0.12 MGD, which is less than the design flow of 0.17 MGD. The plant is susceptible to treatment problems as flows are greatly reduced on weekends opening the possibility of starvation in the aeration tanks, and then when flows resume to normal levels, to shock loadings as certain industries discharge their wastes intermittently.

The average BOD of the influent was greater than 788 mg/1 while the effluent BOD averaged out to 32 mg/1. This BOD removal yielded an efficiency of greater than 95.0%. The total pounds of BOD discharged per day was 31.4.

The average chemical oxygen demand of the influent and effluent were 2098 mg/1 and 193 mg/1, respectively, giving a removal efficiency of

88.8%. The plant loading per day was 191 pounds. The difference in magnitude between the BOD and COD tests indicates the presence of biologically resistant substances and/or oxidizable dissolved inorganics.

The influent and effluent TSS averaged 866 mg/l and 27 mg/l, respectively. The total volatile suspended solids (VSS) concentrations were 783 mg/l and 21 mg/l, respectively. This plant discharged 29.5 pounds of TSS and 22.8 pounds of VSS daily. Settleable solids removal was 98.9 percent.

The nutrients measured during the study were total organic carbon (TOC), ammonia nitrogen, organic nitrogen, nitrate-nitrite nitrogen and phosphorus. The TOC was also measured as a treatment parameter. An average influent value of 530 mg/l and average effluent value of 42 mg/l was obtained during the study producing a treatment efficiency of 89.5 percent. A total load of 41.5 lbs per day of TOC was discharged by the plant. The loadings of other nutrients in pounds per day were organic nitrogen, 3.8, ammonia nitrogen, 4.0, nitrate-nitrite nitrogen, 0.04, and phosphorus, 6.3. The sum of all nitrogen discharged was 8.2 pounds per day.

The average chlorine residual in the effluent of the plant was greater than 3.5 mg/l. The effluent coliform levels indicated the plant chlorination process adequately disinfected the effluent.

The daily values for all parameters are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF PLANT OBSERVATIONS

General appearance, "housekeeping", and mechanical maintenance were excellent. Visual appearance of the sludge in the activated sludge units was somewhat abnormal. The material was a light brown, without the normal "earthy" color of activated sludge. The reason for this discoloration is not immediately obvious, although it may be caused by the processing of dairy and beverage wastes. These wastes have caused complications in plant operations in the past, since they impose high BOD shock loadings on the plant. This malady of shock loading could be ameliorated if surge tanks were installed on the influent line prior to the aeration.

Review of the data indicates unusually high influent BOD concentrations. The plant processes wastes of twenty-one industries in the Industrial Park, plus wastes from North Dade Junior College. Flow during the week-end is greatly reduced.

Mr. Backmeyer informed us that plans have been initiated for phasing out this plant, with disposal of the wastes to be accomplished through the North Miami outfall. The exact date of this change is not definite at this time.

A flow diagram of the plant is attached to the report.

MICHAEL V. POLITO

ROBERT L. KING

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT: January 1971
PLANT NAME: Seaboard Air Lines Industrial Park wastewater treatment plant
PLANT OWNER: City of Miami
ADDRESS: Mr. Garrett Sloan, Dept. of Water and Sewers, P.O. Box 316, Miami, Fla.33133
TELEPHONE:
COLLECTION SYSTEM – TYPE: separate
OWNER: same as above
ADDRESS:
TELEPHONE:

SIZE: AVERAGE DESIGN FLOW: 0.174 MGD MGD YEAR COMPLETED: 1965
[illegible] DURATION days FREQUENCY Yrs
[illegible]
[illegible] SERVED: 21 industries plus North Dade Junior College (see attachment)

[illegible] ANNUAL COST: $4,000
[illegible]: 2 men, 3/4 time
LEVEL OF CERTIFICATION: No data
CONDITION OF EQUIPMENT: Excellent
OUTFALL: TYPE: Submerged SIZE LENGTH
DISCHARGED TO: Little River Canal WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL)
Two-cell activated sludge plant, two-cell secondary clarifier, chlorine contact chamber.

Reproduced from best available copy.

SLUDGE: TREATMENT: Single stage aerobic digester.

DISPOSAL:

REMARKS:

PREPARED BY:

ATTACHMENT #1

LIST OF WATER USERS CONTRIBUTING TO SEABOARD AIR LINES INDUSTRIAL PARK WASTEWATER TREATMENT PLANT.

USER	AVG. DAILY WATER USE (Gallons)
North Dade Junior College	124,000
Smith Terminal	---
Zayres	---
Miami Rug	---
General Electric	---
Georgia Pacific	---
Continental Can	18,000
Florida Paper Mill	500
Super Brand Dairy	47,000
Beverage Canners, Inc.	36,000
Su-Ro Company	200
National Brands	4,100
Southern Bell Industries	---
R. E. Hunt Company	50
Florida Power and Lights	50
Standard Brands	300
August Brothers Dairy	8,900
Sertile Supply	2,300
Kravex Manufacturing Corporation	600
Seaboard Railroad	13,300

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT DATA SUMMARY

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PLANT Seaboard Ind Park

DATE - OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE
FLOW - MGD		.06	.14	.14	.14	.12	.12
5 DAY BOD mg/l	INFLUENT	424	614	1352	685	>865	>788
	EFFLUENT	41	21	20	52	28	32
	IN - OUT	383	597	1332			
	% REMOVAL	90.3	96.6	98.5	92.4	96.8	>94.9
	LOAD-lbs/day	20.5	24.5	23.4	60.7	28.0	31.4
COD mg/l	INFLUENT	1261	1167	2718	3616	1726	2098
	EFFLUENT	177	149	154	166	318	193
	IN - OUT	[illegible]	[illegible]	2564	3450	1408	
	% REMOVAL	[illegible]	87.2	94.3	95.4	81.6	88.9
	LOAD -lbs/day	88.6	174.0	179.8	193.8	318.3	190.9
TSS mg/l	INFLUENT	796	260	2230	580	464	866
	EFFLUENT	10	11	24	58	34	27
	IN - OUT	786	249	2206	522	430	
	% REMOVAL	98.7	95.8	98.9	90.0	92.7	952
	LOAD- lbs/day	5.0	12.8	28.0	67.7	34.0	29.5
VSS mg/l	INFLUENT	640	224	2060	556	436	783
	EFFLUENT	6	7	18	42	33	21
	IN - OUT	634	217	2042	514	403	
	% REMOVAL	99.1	96.9	99.1	92.4	92.4	96.0
	LOAD -lbs/day	3.0	8.2	21.0	49.0	33.0	22.8
Settlable Solids ml/l	INFLUENT	16	12	>40	9	11	>18
	EFFLUENT	0	0	0	0.5	0.0	.1
	IN - OUT						
	% REMOVAL	100	100	100	94.4	100	98.9
TOC mg/l	INFLUENT	283	305	1240	450	370	530
	EFFLUENT	49	37	45	45	35	42
	IN - OUT						
	% REMOVAL	828	87.9	96.4	90	90.5	89.5
	LOAD - lbs/day	24.5	43.2	52.5	52.5	35.0	41.5

INFLUENT BOD POPULATION EQUIVALENT = ________

EFFLUENT BOD POPULATION EQUIVALENT = ________

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

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From The Desk Of
Michael V. Polito

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Seaboard

DATE - OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE or MEDIAN*
FLOW - MGD		.06	.14	.14	.14	.12	.12
KJELDAHL NITROGEN as N	CONC.-mg/l	13.9	12.7	4.8	5.90	4.80	8.4
	LOAD-lbs/day	7.0	14.8	5.6	6.9	4.8	7.82
AMMONIA NITROGEN as N	CONC.-mg/l	11.0	10.6	1.4	0.43	0.05	4.7
	LOAD-lbs/day	5.5	12.4	1.6	.50	.05	4.0
ORGANIC NITROGEN as N	CONC.-mg/l	2.9	2.1	3.4	5.47	4.75	3.7
	LOAD-lbs/day	1.5	2.5	4.0	6.4	4.75	3.8
NO_2 -NO_3 as N	CONC.-mg/l	0.08	0.01	0.12	0.01	0.01	.05
	LOAD-lbs/day	.04	.01	.14	.01	.01	.04
TOTAL PHOSPHORUS AS P	CONC.-mg/l	9.4	9.7	6.5	4.6	2.6	6.6
	LOAD-lbs/day	4.7	11.3	7.6	5.4	2.6	6.3
CHLORIDE	CONC.-mg/l	72	64	64	44	66	62
TOTAL COLIFORM	CONC - MPN/100ml	33	<18	<18	20	-	19
Fecal COLIFORM	CONC - MPN/100ml	20	<18	<18	20	-	19

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Seaboard Ind. Park

DATE ON		1/24/71	1/25/71	1 Jan. 71	1/27/71	1/28/71	AVERAGE
TIME ON		2040	1110	1140	1310	1310	
DATE OFF		1/25/71	1 Jan. 71	1/27/71	1/28/71	1/29/71	
TIME OFF		1110	1140	1310	1310	1140	
FLOW	START X100	1835626	1836242	1837686	1,839,153	1,840,554	
	END	1836242	1837686	1839153	1,840,554	1,841,681	
	TOTAL	61600	144400	146700	140,100	112700	
	24 hr. Flow Rate	[illegible]	[illegible]	[illegible]	140,100	[illegible]	[illegible]
INF.	TEMP. ON	27.4	25.8	25.5	24.7	24.2	25.5
	PH - ON	7.3	6.6	7.5	7.5	6.4	7.1
EFFLUENT	TEMP - ON	22.3	25.	23.8	21.8	20.6	22.7
	PH - ON	6.2	6.1	5.7	6.0	5.9	6.0
	Cl. Residual	>5.0	5.0	5.0	1.0	1.5	>3.5
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
1/25/71	Normal	Supernating Digester Normal	Eff. missed 13-18 very little flow	LRW
1/26/71	Heavy foam in aerators & channel to clarifiers Some foam in Cl2 chamber	1 Aerator shut off	OK	LRW
1/27/71	foam in Cl2 Contact	Normal	Brown solids in bottles 24,1,2,3 OK	LRW
1/28/71	foam in Cl2	Normal	OK	LRW
1/29/71	" "	Normal	Inf #17 Pink Tinge	LRW

* [illegible] LRW

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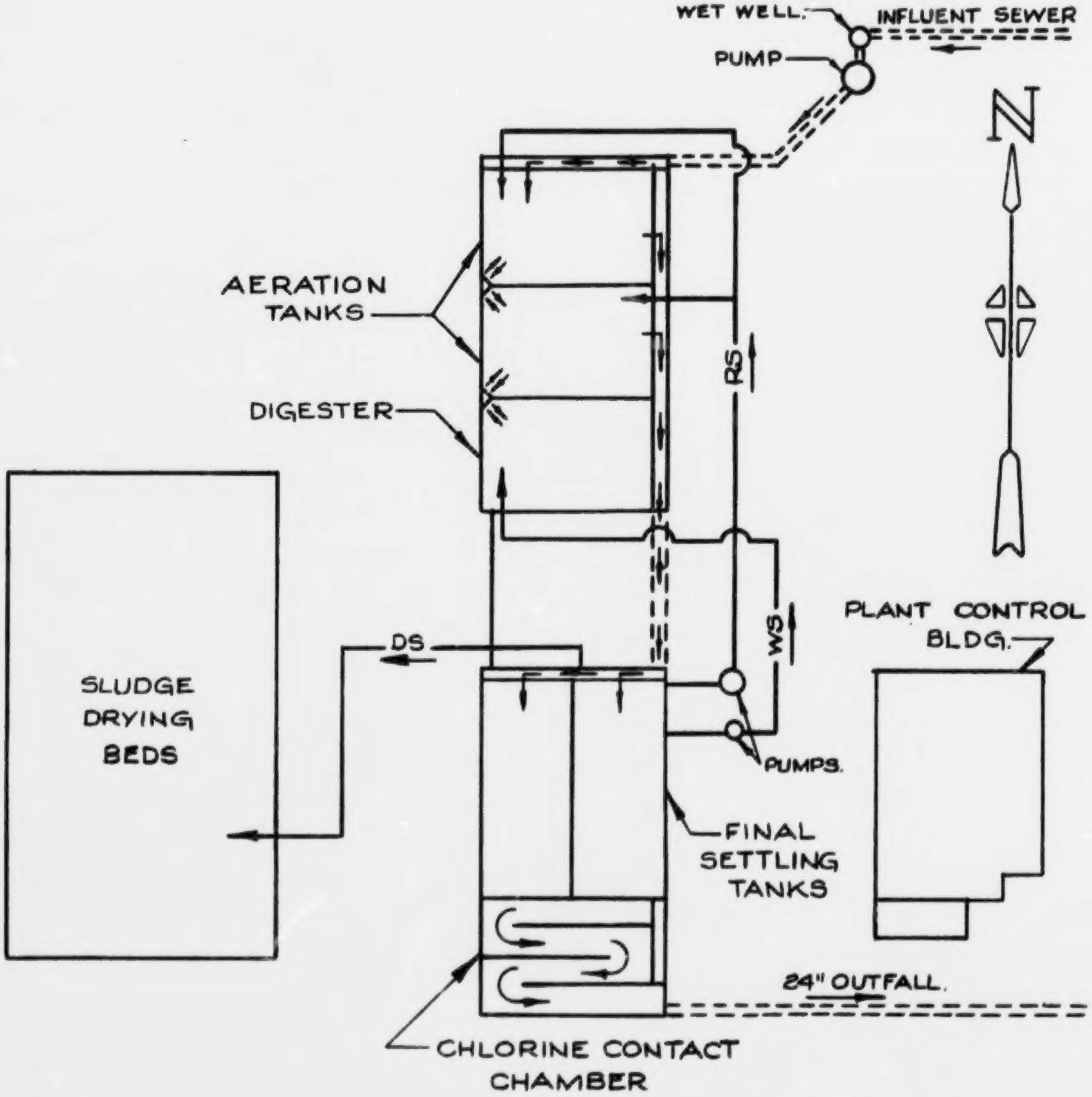
RAW SEWAGE WET WELL.
INFLUENT SEWER
PUMP
N
AERATION TANKS
DIGESTER
RS
WS
DS
SLUDGE DRYING BEDS
PLANT CONTROL BLDG.
PUMPS.
FINAL SETTLING TANKS
24" OUTFALL.
CHLORINE CONTACT CHAMBER

LEGEND

WS — WASTE SLUDGE.
RS — RETURN SLUDGE.
DS — DIGESTED SLUDGE.

SEABOARD INDUSTRIAL PARK
SEWAGE TREATMENT PLANT
FLOW CHART.

DEPARTMENT OF WATER AND SEWERS
CITY OF MIAMI

Date: 1-19-71	Scale: None
	S-445-C

LOWER FLORIDA ESTUARY STUDY
Report on Waterborne Wastes From
Sunny Isles Pumping Station
Dade County Water and Sewer Department
Miami, Dade County, Florida
March 22, 1971

INTRODUCTION

The Sunny Isles Pumping Station was sampled on February 1-2, 1971. Single grab samples were taken daily, as the effluent flows into the North Miami Outfall, and only grab samples could be taken of that outfall. Messrs. Laurence Walz and Terry Davis were sample collectors. Primary contact was Mr. Jim Peters of the Dade County Water and Sewer Department.

SUMMARY RESULTS AND CONCLUSIONS

The Sunny Isles Pumping Station contributes approximately 1.5 MGD of flow to the North Miami Ocean Outfall. The average 5-day biochemical oxygen demand (BOD) of the effluent was 144 mg/l. Total BOD loading from this pumping station was approximately 1800 lbs. per day contributed to the North Miami Outfall. The average total suspended solids (TSS) concentration was 91 mg/l and the average daily discharge of TSS was 1138 lbs. per day. No chlorination of the effluent is accomplished, so bacteriological samples were not collected. The present method of treatment of wastes being discharged from the North Miami Outfall is inconsistent with the Dade County Enforcement Conference recommendation that all discharges to the Atlantic Ocean be given secondary treatment, with at least 90 percent removal of BOD and suspended solids. It is recommended that appropriate treatment facilities be constructed as soon as possible, but no later than January 1, 1974. Daily values of the data collected during the two days of this study are presented in the attached field and data summary sheets.

DISCUSSION OF OBSERVATIONS

This pumping station provides preliminary treatment of wastes prior to pumping into the North Miami Ocean Outfall. This preliminary treatment consists of comminution, and removal of floatable solids from the effluent. This removal of floatable solids is accomplished by allowing the waste water to flow through a primary clarifier, where skimmings are discharged and the settled sludge re-combined with the supernatent and this combined unchlorinated material pumped to the ocean outfall line. This treatment is inconsistent with the Dade County Enforcement Conference recommendation that all effluent to the Atlantic Ocean be given secondary treatment, with at least 90 percent removal of BOD and year-round chlorination of the effluent.

Prepared by Robert L. King

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Sunny Isles

	DATE - OFF	2-1-71	2/2				AVERAGE
	FLOW - MGD						
5 DAY B O D mg/l	INFLUENT	169	118				144
	EFFLUENT						
	IN - OUT						☒
	% REMOVAL						
	LOAD-lbs/day						
C O D mg/l	INFLUENT	776	343				560
	EFFLUENT	NO EFF	N/S				
	IN - OUT						☒
	% REMOVAL						
	LOAD -lbs/day						
T S S mg/l	INFLUENT	108	74				91
	EFFLUENT						
	IN - OUT						☒
	% REMOVAL						
	LOAD- lbs/day						
V S S mg/l	INFLUENT	56	62				79
	EFFLUENT						
	IN - OUT						☒
	% REMOVAL						
	LOAD --lbs/day						
Settlable Solids ml/l	INFLUENT	2	2				2
	EFFLUENT						
	IN - OUT						☒
	% REMOVAL						
T O C mg/l	INFLUENT	140	54				97
	EFFLUENT	raw	raw				
	IN - OUT						☒
	% REMOVAL						
	LOAD - lbs/day						

INFLUENT BOD POPULATION EQUIVALENT =______

EFFLUENT BOD POPULATION EQUIVALENT =______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

Released

**From The Desk Of
Michael V. Polito**

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT________________________________

DATE - OFF		2/1-71	2/2				AVERAGE or MEDIAN*
FLOW - MGD							
KTELDAHL NITROGEN as N	CONC.-mg/l	33.5	43.2				38.4
	LOAD-lbs/day						
AMMONIA NITROGEN as N	CONC.-mg/l	28.62	24.19				26.41
	LOAD-lbs/day						
ORGANIC NITROGEN as N	CONC.-mg/l						
	LOAD-lbs/day						
NO_2 -NO_3 as N	CONC.-mg/l	0.025	0.025				0.025
	LOAD-lbs/day						
TOTAL PHOSPHORUS AS P	CONC.-mg/l	8.6	7.3				8.0
	LOAD-lbs/day						
CHLORIDE	CONC.-mg/l	1276	1480				1353
TOTAL COLIFORM	CONC - MPN/100ml						
Fecal COLIFORM	CONC - MPN/100ml						

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Sunny Isles

							AVERAGE
DATE ON		2/1/71	2/9/71				
TIME ON		1010	0930				
DATE OFF		Grab	Grab				
TIME OFF							
FLOW	START						
	END						
	TOTAL						
	24 hr. Flow Rate						
INF.	TEMP. ON						
	PH - ON						
EFFLUENT	TEMP - ON						
	PH - ON						
	Cl. Residual						
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY

Lower Florida Estuary Study
Report on Waterborne Wastes from Westwood Lakes, Inc., Waste Water Treatment Plant

4801 S. W. 117th Avenue
Miami, Dade County, Florida
March 22, 1971

INTRODUCTION

The Westwood Lakes Waste Water Treatment Plant was surveyed during the period January 24 - 29, 1971. The system is composed of a trickling filter plant plus an activated sludge plant. Serco automatic samplers were utilized to collect five 24-hour composites of the influent and effluent after chlorination. The effluent sample was a composite of individual samples collected from each of the two plants. Sample collectors were Messrs. Lawrence Walz and Joe Hopson. Primary contact was Mr. Ray Sweeney, Plant Manager, Westwood Lakes, Inc.

SUMMARY AND CONCLUSIONS

The average flow during the study was 1.98 MGD. The plant is not hydraulically overloaded. The designed flow of the combined activated sludge and trickling filter units is 2.62 MGD. The average biochemical oxygen demand (BOD) of the influent was 227 mg/l while the average BOD of the effluent was 57 mg/l. The average total suspended solids (TSS) concentrations encountered during the study were 798 mg/l in the influent and 52 mg/l in the effluent. The chlorine residual in the effluent of this plant was 2.5 mg/l.

A BOD removal of less than 90% was obtained in the plant. The average removal found, was 74.6%.

The average total suspended solids removal obtained during the study was greater than 90%. The average removal found was 94.3%.

All averages obtained were calculated by summing of daily values.

INVENTORY

The system is composed of a trickling filter plant with capacity of 1.9 MGD and an activated sludge plant with a capacity of 0.72 MGD. Major components of the plants are as follows:

Plant 1. Trickling filter.

a. Circular primary clarifier designed for a detention time of 2 hours.

b. High rate trickling filter.

c. Final clarifier, designed for 2 hours detention time.

d. Chlorine contact chamber with 15 minutes detention time.

Plant 2. Activated sludge unit.

a. Contact tank.

b. Clarifier.

c. Stabilization tank.

d. Chlorine contact chamber.

DISCUSSION OF RESULTS

The average flow at the Westwood Lakes Waste Water Treatment Plant was 1.98 MGD, which is less than the combined design flow of the two biological treatment units of 2.62 MGD. The flow is greater than the individual unit design flows, the trickling filter hydraulic design being 1.90 MGD and the activated sludge hydraulic design being 0.72 MGD.

Treatment plant efficiencies were evaluated by the following tests: biochemical oxygen demand, chemical oxygen demand, total suspended solids, total volatile solids, and total organic carbon. Nutrients quantitated in the effluent were the previously mentioned total organic carbon, organic nitrogen, ammonia nitrogen, nitrate-nitrite nitrogen, and phosphorus.

The average BOD's of the influent and effluent wer 227 mg/l and 57 mg/l. This BOD removal yielded an average removal efficiency of 74.6%. The total pounds of BOD discharged per day was 941 pounds.

The average chemical oxygen demand (COD) of the influent and effluent were 556 mg/l and 164 mg/l, respectively, giving a removal efficiency of 70.1%. The COD load discharged by the plant during the study was 2705 pounds per day.

The average total organic carbon (TOC) concentrations of the influent and effluent were 128 mg/l and 58 mg/l, respectively, giving a removal efficiency of 52.4%. The TOC load discharged by the plant was 960 pounds per day.

The influent and effluent total suspended solids (TSS) averaged 798 mg/l and 52 mg/l. The average total volatile suspended solids (VSS) found in the influent and effluent were 743 mg/l and 47 mg/l. This plant discharged 870 pounds per day of TSS and 777 pounds per day of VSS. Settleable solids removal was 98.1%.

The nutrient loads discharged by the plant in pounds per day were: organic nitrogen, 96; ammonia nitrogen, 317; nitrate-nitrite nitrogen, 4; and phosphorus, 194. The combined sum of total nitrogen discharged was 417 pounds per day.

The average chlorine residual in the effluent of both plants was 2.5 mg/l. The plant chlorination process was sufficient to produce adequate disinfection in the fecal coliform levels of both plant treatment units (trickling filter and activated sludge unit) and for adequate disinfection of total coliform in the activated sludge discharge, but did not adequately remove the total coliform from the effluent of the trickling filter where a median value of 790 MPN/100 ml total coliform was obtained with two of the daily values being 46,000 and 4,900 MPN/100 ml.

The daily values for all parameters are presented in the attached Field and Data Summary Sheets.

DISCUSSION OF PLANT OPERATION

General appearance, "housekeeping," and mechanical maintenance were good during the survey. Visual appearance of the effluent was fair. A new aerobic digester was completed and put into operation on January 12, 1971. Prior to this date the activated sludge unit had been used as an aerobic digester for some nine months. On January 12, 1971, this unit was pumped and cleaned and flow was introduced for reactivating the unit as an activated sludge system. The general schedule of operations was as follows:

Date 1971	Total Flow	Flow Through Trickling Filter	Flow Through Activated Sludge Plant	Remarks
Jan. 12	2.2	2.2	0.0	0.818 MGD from filter split and processed through clarifier from activated sludge unit. Activated sludge tank drained to be put back in operation.
Jan. 14	2.14 MGD	2.14	0.0	All flow through final clarifier for trickling filter.
Jan. 15	1.82	1.68	0.138	Start up of activated sludge unit.
Jan. 16	1.86	1.50	0.35	
Jan. 17	no data	1.36	no data	Flow meter for activated sludge unit out of operation.
Jan. 18	1.88	1.42	0.46	
Jan. 19	2.01	1.52	0.49	
Jan. 20	2.25	1.50	0.75	Activated sludge unit fully operational.

We were aware that start-up of the activated sludge unit had been initiated the week before the study, as continuous attempts had been made to schedule a survey of this plant. The time schedule for completion of the entire municipal survey did not allow any further sampling delay.

MICHAEL V. POLITO

ROBERT L. KING

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT – GENERAL INFORMATION

DATE OF VISIT February 3, 1971
PLANT NAME: Westwood Lakes, Incorporated.
PLANT OWNER: Westwood Lakes, Incorporated.
ADDRESS 4801 S. W. 117th Avenue, Miami, Florida
TELEPHONE
COLLECTION SYSTEM – TYPE: Separate
OWNER: Same as above
ADDRESS:
TELEPHONE

DESIGN AVERAGE DESIGN FLOW: 2.62 MGD MGD YEAR COMPLETED: No data
STREAM LOW FLOW cfs | DURATION days FREQUENCY Yrs
CONSTRUCTION COST
POPULATION SERVED 6,200 Connections

OPERATION ANNUAL COST
PERSONNEL Chief Operator, 3 Operators, Lab Technician.
LEVEL OF CERTIFICATION Chief Operator has A
CONDITION OF EQUIPMENT Good
OUTFALL TYPE SIZE LENGTH
DISCHARGED TO: Snapper Creek WATER COURSE MILEAGE:
LATITUDE LONGITUDE
TREATMENT (LIST UNITS IN ORDER, EXCLUDING SLUDGE TREATMENT & DISPOSAL) Splitter Box, Primary Clarifier, Trickling Filter, Secondary Clarifier. In parallel, contact stabilization, secondary clarifier, with chlorine contact chamber for both systems.

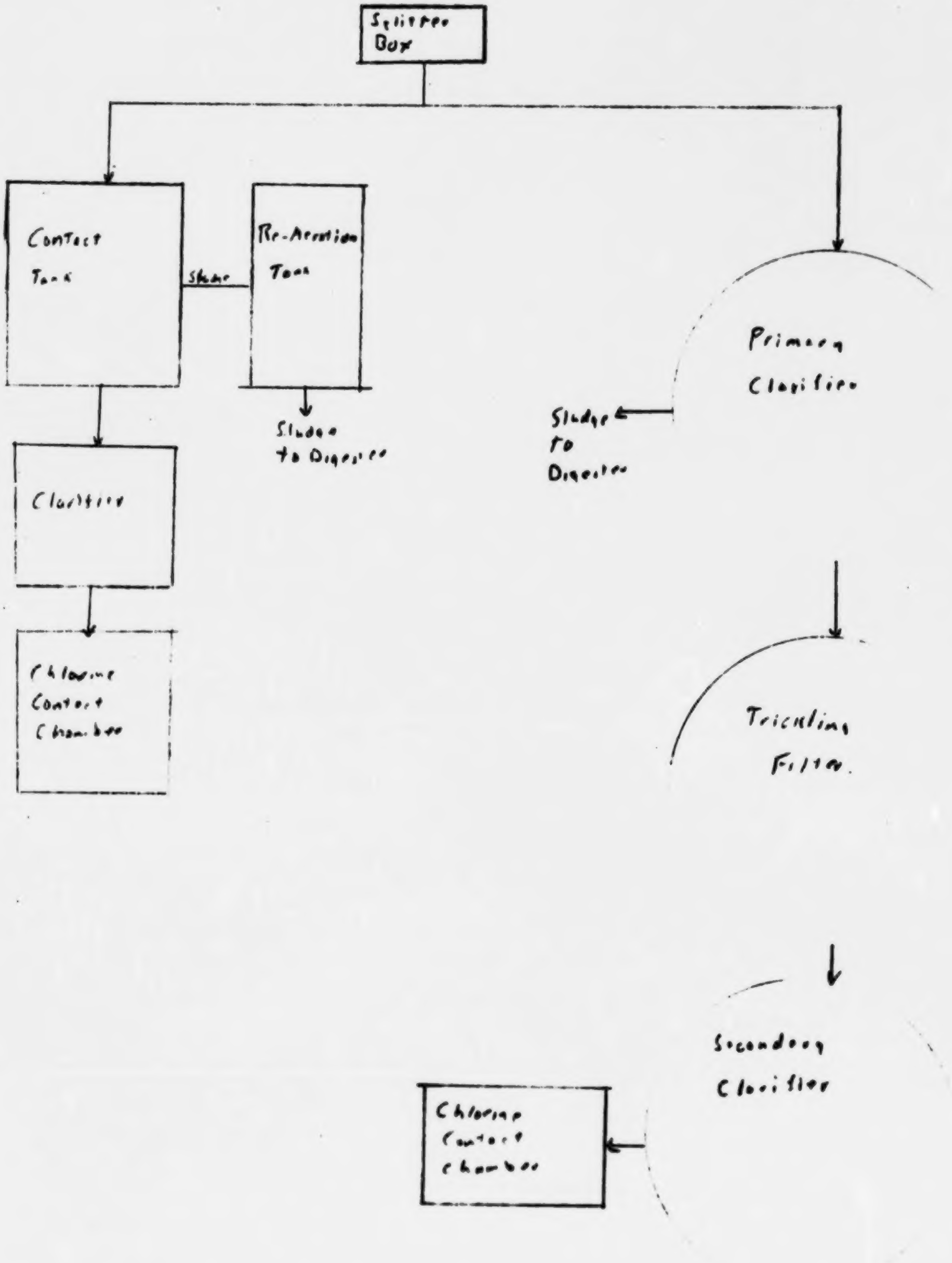
SLUDGE TREATMENT Two-stage aerobic digester.

DISPOSAL Sludge drying beds.

REMARKS

EPARED BY:

Westwood Lakes Wastewater Treatment Plant


Splitter Box
Contact Tank
Re-Aeration Tank
Sludge to Digester
Clarifier
Chlorine Contact Chamber
Primary Clarifier
Sludge to Digester
Trickling Filter
Secondary Clarifier
Chlorine Contact Chamber

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Sheet ___ of ______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
INFLUENT – EFFLUENT – DATA SUMMARY

PLANT Westwood Lakes.

DATE - OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE
FLOW - MGD		2.00	2.05	2.01	1.91	1.90	1.98
5 DAY B O D mg/l	INFLUENT	234	NO sample	178	214	280	227
	EFFLUENT	63	64	60	56	42	57
	IN - OUT					238	
	% REMOVAL	73.1	N/A	66.3	73.8	→ 85.	74.6
	LOAD-lbs/day	1050.8	1094.2	1005.8	892.0	665.5	941.7 941
C O D mg/l	INFLUENT	473	NO INF	498	576	677	556
	EFFLUENT	165	173	178	162	142	164
	IN - OUT	308	—	320			
	% REMOVAL	65.1	N/A	64.3	71.9	79.0	70.1
	LOAD -lbs/day	2752.2	2957.8	2983.9	2580.6	2250.1	2704.9
T S S mg/l	INFLUENT	248	N/S	992	756	1197	798
	EFFLUENT	30	128	28	31	44	52
	IN - OUT	~~87.9~~		964	725	1153	
	% REMOVAL	87.9	N/A	97.2	95.9	96.3	94.3
	LOAD- lbs/day	500.4	2188.4	469.4	493.8	697.2	869.8
V S S mg/l	INFLUENT	228	N/S	968	720	1116	743
	EFFLUENT	24	121	20	26	42	47
	IN - OUT						
	% REMOVAL	89.5	N/A	97.8	96.4	96.2	95.0
	LOAD –lbs/day	400.3	2068.7	335.3	414.2	665.5	776.8
Settlable Solids ml/l	INFLUENT	15	N/S	8	insuf. sample	17	13.3
	EFFLUENT	0.1	0.5	0.3	0.2	0.2	,3
	IN - OUT						
	% REMOVAL	99.3	N/A	96.2	N/A	98.8	98.1
T O C mg/l	INFLUENT	140	N/S	135	170	65	128
	EFFLUENT	49	65	68	66	43	58
	IN - OUT						
	% REMOVAL	65.0	N/A	49.6	61.2	33.8	52.4
	LOAD - lbs/day	817.3	1111.3	1139.9	1051.3	681.4	960.2

INFLUENT BOD POPULATION EQUIVALENT = ______

EFFLUENT BOD POPULATION EQUIVALENT = ______

LOAD = FLOW (MGD) x EFFLUENT (mg/l) x 8.34 = lbs/day

From The Desk Of
Michael V. Polito

Released from

From The Desk Of
Michael V. Polito

Sheet____ of______

LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
EFFLUENT DATA SUMMARY

PLANT Westwood Lakes

DATE - OFF		1/25	1/26	1/27	1/28	1/29	AVERAGE or MEDIAN*
FLOW - MGD		2.00	2.05	2.04	1.99	1.90	1.98
KTELDAHL NITROGEN as N	CONC.-mg/l	24.7	25.5	25.4	24.8	25.0	25.1
	LOAD-lbs/day	412.0	436.0	425.8	395.0	396.2	413.0
AMMONIA NITROGEN as N	CONC.-mg/l	20.0	20.0	21.0	18.0	17.0	19.2
	LOAD-lbs/day	3336	341.9	352.0	[illegible]	269.4	316.7
ORGANIC NITROGEN as N	CONC.-mg/l	4.7	5.5	4.4	6.8	8.0	5.9
	LOAD-lbs/day	78.4	94.0	73.8	108.73	126.8	96.3
NO_2 -NO_3 as N	CONC.-mg/l	0.18	0.78	0.13	0.12	0.10	.26
	LOAD-lbs/day	3.0	13.3	2.2	1.91	1.6	4.4
TOTAL PHOSPHORUS AS P	CONC.-mg/l	12.1	12.5	12.0	11.3	11.0	11.8
	LOAD-lbs/day	201.8	213.7	201.2	180.0	174.3	194.2
CHLORIDE	CONC.-mg/l	56	56	57	55	59	57
TOTAL COLIFORM	CONC. - #1 MPN/100ml	20	46,000	4900	170	790	790
	#2	20	<18	45	<18	78	20
Fecal COLIFORM	CONC. - #1 MPN/100ml	<18	13,000	20	<18	<18	<18
	#2	<18	<18	<18	<18	<18	<18

*Calculate Median for Total & Fecal Coliform Concentrations and Average for All Other Parameters.

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LOWER FLORIDA ESTUARY STUDY
DADE COUNTY WASTE SOURCE INVENTORY
TREATMENT PLANT FIELD SHEET

PLANT Westwood Lakes

	DATE ON	1/24/71	1/25/71	1/26/71	1/27/71	1/28/71	AVERAGE
	TIME ON	0940	0940	1010	1040	1040	
	DATE OFF	1/25/71	1/26/71	1/27/71	1/28/71	1/29/71	
	TIME OFF	0940	1010	1040	1040	1020	
FLOW	START Yec. / Hew	870145 / 835722	885144 / 836220	899257 / 836490	914070 / 837472	~~927580 / 838092~~ 940077 / 838635	
	END	885144 / 836222	899257 / 836400	914070 / 837473	927582 / 838092	↓ / ↓	
	TOTAL	*2,004,900	[illegible]	[illegible]	1,910,200	1,878,500	~~1975 [illegible]~~
	24 hr. Flow Rate	2,004,900	[illegible]	[illegible]	1,910,200	~~[illegible]~~	~~1,950,150~~
INF.	TEMP. ON	24.1	24.4	23.8	23.6	23.6	23.9
	PH - ON	7.2	7.3	7.0	7.0	6.5	7.0
EFFLUENT	TEMP - ON	24.0	#1 23.4 #2 23.6	#1 23.2 #2 23.2	#1 22.4 #2 21.6	#1 22.2 #2 22.3	#1 23.1 #2 22.7
	PH - ON	6.8	6.7 6.9	6.6 6.6	6.7 6.8	6.2 6.2	6.6 6.7
	Cl. Residual	>2.5	2.5 2.5	2.5 2.5	2.5 2.5	2.5 2.5	2.5 2.5
	CHLORINE-ON						
	CHLORINE-OFF						
	ON-OFF-lbs						

DATE	WASTE CHARACTERISTICS	PLANT OPERATION	AUTO. SAMPLER OPERATION	SAMPLES COLLECTED BY
1/25/71	Normal	larvae in Effluent	Inf. low flow see back sheet OK - Eff	LRW
26 Jan 71	Normal	Same as above & one pump between tricle filter & sec. clar. was off ≈ 1 hr.	No inf - clock stopped #10, 11, 17 eff blank	
1/27/71	Normal	Psycoda larvae in Trickling filter Eff	Inf - short	LRW
1/28/71	Normal	Psycoda larvae in Trickling filter Eff	Inf. - Short	LRW
1/29/71	Normal	Same as Above	OK	LRW

27.4

150-29

1355

* ~~1,997,151~~. 24 hr Flow Rate for 1/25/71

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